The Builder.

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Architect, Engineer, Operative & Artist.

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GEOLOGY, KING'S COLLEGE, LONDON.—Professor TENNANT, F.G.S. will COMMENCE a COURSE of LECTURES on GEOLOGY, on FRIDAY Morning, JANUARY 27, at NINE o'clock. They will be continued on each succeeding Wednesday and Friday, at the same hour. Fee, 2*l.* 12*s.* 6*d.*
R. W. JELF, D.D., Principal.

THE WORKMEN'S INSTITUTE and BENEFIT CLUB, 239, EUSTON-ROAD, N.W.; and 34, YORK-ROAD, LAMBETH, S.

PRESIDENT—His Grace the Duke of Northumberland, K.G.

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With six representatives from the largest districts.

This Institution has been established for the welfare of workmen of all classes, by providing for them Reading-rooms and Libraries, and Houses of Call for those out of work, and by enabling them, through the Benefit Club, to make provision in sickness and old age, without resorting to a public-house. The Institution is intended to be self-supporting, but it requires aid in its early stage; therefore, all who wish well to the working man are earnestly solicited to afford it their support: to enable which, subscriptions will be received by Messrs. Smith, Payne, & Smith, 1, Lombard-street, E.C.; Messrs. Glyn, Mills, & Co. 67, Lombard-street, E.C.; Messrs. Lubbock, Foster, & Co. Mansion House-street, E.C.; Messrs. Ransom & Co. 1, Pall-mall, East, S.W.; and by the Honorary Secretaries, Conrad Wilkinson, esq. Beckenham, Kent, and G. J. Bowyer, esq. 43, Ampthill-square, N.W.

The rules of the Benefit Club are now ready, and may be obtained at either of the branches, as above.

Those desirous of promoting in their districts the establishment of similar district Institutes are requested to communicate with the Secretary at 239, Euston-road, N.W.

WORKMEN'S INSTITUTE and BENEFIT CLUB, 34, YORK-ROAD, LAMBETH, S.—At a large Meeting of the Workmen's Institute and Benefit Club, held this evening, it was resolved that a PRELIMINARY PUBLIC MEETING of WORKMEN should be held, at 34, YORK ROAD, Lambeth, on MONDAY EVENING next, the 23rd instant, at HALF-PAST EIGHT o'clock, to take into consideration the Rules of the Club, with the view of confirming them at the ADJOURNED GENERAL MEETING, on WEDNESDAY EVENING following, the 25th, at HALF-PAST EIGHT, at the same place.—The attendance of workmen is particularly requested.
18th January, 1860.

SCHOOL for MECHANICAL ENGINEERING, and SCIENTIFIC EDUCATION, at the COLLEGE, Chester.
In addition to English and Mathematics, all the Pupils are taught Drawing suitable for the Architect or Engineer; and, in the Laboratory, the Principles as well as the Practice of Chemistry.
The Use of Tools, the Construction of Machinery, and the Principles of Mechanism may be studied in the various Workshops of the School.
French and German are taught to all who desire it, without any extra charge.
Chemical Analyses undertaken; Steam-engines and Machinery examined and reported upon; and Mechanism designed for special purposes.
For further particulars apply to the Rev. ARTHUR RIGG, Chester.

ARCHITECTURAL EXHIBITION, 1860. DRAWINGS and MODELS to be sent to the Galleries, Maddox-street, entrance, on the 16th of MARCH, before SIX o'clock. Those subscribers who may not have paid last year's subscription are requested to do so immediately, as the Committee are anxious to close the last year's account. Exhibitors of building materials, inventions, &c. should apply immediately.
JAMES FERGUSSON, } Hon. Secs.
9, Conduit-street, W. JAMES EDMESTON, }

PROFESSOR OWEN, Superintendent of the NATURAL HISTORY DEPARTMENT, BRITISH MUSEUM, will commence a course of TWELVE LECTURES on FOSSIL MAMMALIA, at the MUSEUM of PRACTICAL GEOLOGY, Jermyn-street, on FRIDAY, 3rd FEBRUARY, 1860, at TWO o'clock; to be continued on each succeeding Friday at the same hour.
Tickets to be had at the Museum, Jermyn-street. Fee for the course, 5*s.* RODERICK I. MURCHISON, Director.

THE ARCHITECTURAL MUSEUM.—SOUTH KENSINGTON MUSEUM.—DONATIONS in aid of the Fund for PRIZES to ART-WORKMEN for the present year, are earnestly solicited, and will be received by GEORGE GILBERT SCOTT, Treasurer, 20, Spring-gardens, S.W.; JOSEPH CLARKE, Honorary Secretary, 13, Stratford-place, W.

THE ARCHITECTURAL MUSEUM, SOUTH KENSINGTON MUSEUM, W.
On WEDNESDAY, JANUARY 25th, 1860, at EIGHT p.m. a LECTURE will be delivered in the Theatre, the subject being "Records of Workmen: the Past to encourage the Present." By George Godwin, esq. F.R.S. F.S.A.
This Lecture being one of encouragement to workmen, the Council particularly desire to draw the attention of employers to the fact.
Subscribers and artist-workmen may obtain cards of the attendant in the Gallery of the Architectural Museum; at the Office of "The Builder," 1, York-street, Covent-garden; or by letter to the Honorary Secretary, at 13, Stratford-place, W.
GEO. GILBERT SCOTT, A.R.A. Treasurer.
JOSEPH CLARKE, F.S.A. Hon. Sec.

SOCIETY for the ENCOURAGEMENT of the FINE ARTS.—The OPENING SOIREE of the Season 1860 will take place at the SUFFOLK-STREET GALLERY, by kind permission of Mr. H. Wallis, whose fine Collection of Modern Pictures adorn the walls, on THURSDAY EVENING, JANUARY 26th, at EIGHT o'clock, on which occasion the Vocal Association (sixty voices) have consented to give a performance of Madrigals, Part Songs, and other Choral Music. Conductors: M. Benedict and Dr. James Pech. Every Member on this occasion, besides personal admission, will be entitled to a double ticket, for ladies or gentlemen, which will be transferable. The prospectus and programme for the year 1860 with form of application for membership, may be obtained on application to the Honorary Secretary, at the Rooms of the Society, 9, Conduit-street, Regent-street, W.

ART UNION of LONDON.—SUBSCRIPTION ONE GUINEA.—Prizeholders select from the public exhibitions. Every Subscriber has a chance of a valuable prize, and a volume of thirty engravings by W. J. Linton, from celebrated pictures by British artists, together with an impression of a plate by F. Holl, after J. J. Jenkins, entitled "Come Along."
GEORGE GODWIN, } Honorary Secretaries.
LEWIS POCOCK, }
444, West Strand, January, 1860.

COMPETITIONS.

BOROUGH of HALIFAX.—To LANDSCAPE GARDENERS and OTHERS.—The Corporation of Halifax, being the Burial Board, are desirous of receiving DESIGNS and ESTIMATES for LAYING OUT, DRAINING, and ORNAMENTING the LAND which they have purchased as a CEMETERY for the Borough. The designs must embrace,—
1. A ground-plan, showing the carriage roads and walks, the proposed general division of the Cemetery into two parts, and the subdivision of each into grave spaces, differing in size and value, the positions of the chapels, lodges, and other requisite structures, and the land to be set apart for ornamental planting.
2. Sections, showing the earthworks required for the re-arrangement of the surface, and the sizes, depths, and rates of inclination of the drains.
The area of the proposed Cemetery is within 20 acres. A premium of Twenty Guineas will be given for the design which, in the opinion of the Corporation, is the highest in merit, and a premium of Ten Guineas for the one which they consider second best, and both the premiated designs are to become the absolute property of the Corporation. The plans, estimates, and description (if any), must be distinguished by a motto or device, and be accompanied by a sealed envelope containing the name and address of the competitor, bearing a corresponding motto or device to that on the plans, &c. Each competitor is requested to state the terms on which he will superintend to their completion the execution of the works; and, if employed, the premium is to be merged in the sum paid for superintendence.—Lithographed plans of the site with the levels shown in contours of 5 feet altitudes, may be obtained by application to the Town Clerk, on and after the 18th day of JANUARY instant, and the competing designs must be delivered at my Office in the Town-hall, Halifax, on or before MONDAY, the 13th day of FEBRUARY next.—By order of the Burial Board, EDMUND MINSON WAVELL, Town Clerk.
Town-hall, Halifax, 10th January, 1860.

CONTRACTS.

WAR DEPARTMENT CONTRACT.—NOTICE to BUILDERS.—TENDERS are required for the ERECTION of a NINE-GUN BATTERY, with its accessories, &c. at TORRY POINT, near ABERDEEN. Parties desiring to Tender are requested to make application at this Office, on or before the 31st instant. Each party tendering must pay One Guinea for the Bills of Quantities, which will be forwarded to each as soon as prepared by the Surveyor.
Royal Engineer Office, 42, Northumberland-street, Edinburgh, 18th January, 1860.

WAR DEPARTMENT CONTRACT.—NOTICE to BUILDERS.—TENDERS are required for the ERECTION of GUN SHEDS, at Pembroke Dock, South Wales. Parties desiring to Tender for the erection of these works must leave their names at this Office on or before 23rd day of JANUARY, 1860, and pay the sum of half a guinea for the bills of quantities, which will be forwarded to each party as soon as prepared by the Government Surveyor. E. T. FORD.
Royal Engineer Office, Pembroke Dock, January 12, 1860.

WAR DEPARTMENT CONTRACT.—NOTICE to BUILDERS.—TENDERS are required for the ERECTION of a GUN-SHED, at Weymouth. Parties desiring to Tender for the erection of this work, must leave their names at this Office, on or before the 2nd day of FEBRUARY, 1860, and pay the sum of 10*s.* 6*d.* for the bills of quantities, which will be forwarded to each party as soon as prepared by the Government surveyor.
H. NUGENT, Captain R.E. and Major Com.
Royal Engineer Office, Nothe, Weymouth, January 16, 1860.

BOROUGH of WOLVERHAMPTON.—To CONTRACTORS, MANURE DEALERS, and OTHERS. TENDERS for REMOVAL of NIGHT SOIL.—The Council acting as the Local Board of Health of the said Borough, require TENDERS from persons who may be willing to undertake the removal of the PRIVY MANURE, ASHES, and SURFACE FILTH of the Borough. Printed copies of the proposed Contract and specification may be obtained from the Town Clerk on payment of 2*s.* 6*d.* for each copy. Tenders to be sent to the Town Clerk on or before WEDNESDAY, the 15th day of FEBRUARY next, indorsed "Tender for Removal of Night Soil, &c."—By order,
EDWIN JOHN HAYES, Town Clerk, and Clerk to the Local Board of Health.
Town-hall, Wolverhampton, 17th January, 1860.

TO BUILDERS.—Persons willing to CONTRACT for the BUILDING of the ABEL SMITH MEMORIAL SCHOOL, Hertford, may inspect the plans and specifications after the 21st day of January, on application to the Rev. G. Yeats, All Saints' Vicarage, Hertford, to whom Tenders are to be sent (sealed and endorsed "Tenders for School"), on or before MONDAY, the 13th day of FEBRUARY.—Any further particulars may be obtained of the Architect, Mr. JOHN M. HOOKER, Brenchley, Kent.
N.B. The lowest or any Tender will not necessarily be accepted.

TO BUILDERS.—PORTSEA ISLAND UNION.—Notice is hereby given, that the plans of BUILDINGS intended to be ERECTED as additions to the UNION WORKHOUSE, on the land adjoining, are, with the specifications, open for inspection at my Office, No. 41, St. Mary-street, Portsmouth. And the Guardians of the Poor of this Union will, at their first meeting, to be held in the month of MARCH next, be ready to receive TENDERS from persons willing to CONTRACT for the performance of the WORKS. The day for delivering the Tenders will be notified hereafter.
W. DEVEREUX, Clerk.
Any further information can be obtained of Mr. GEORGE RAKE, Architect, St. George's-square, Portsea.

TO BUILDERS and OTHERS.—BRIDSTOW CHURCH.—Persons desirous of submitting TENDERS for RE-BUILDING the PARISH CHURCH of BRIDSTOW, near Ross, are informed that they can inspect the plans and specification at the Office of the Architect. The Tenders are requested to be delivered on or before the 4th FEBRUARY next, and no pledge is given that the lowest will necessarily be accepted.
THOS. NICHOLSON, Diocesan Architect, Hereford.

TO IRONMONGERS, SMITHS, and CONTRACTORS.—LOCAL BOARD of HEALTH for the District of WISBECH.—Persons willing to CONTRACT with the above Board for supplying and putting down about 220 feet of substantial WROUGHT-IRON FENCE, along the river side, in the town of Wisbech, are requested to send or deliver to RICHARD YOUNG, Esq. Mayor, on or before THURSDAY, the 2nd of FEBRUARY next, sealed Tenders for executing the work. The Tenders to be endorsed "Tender for Iron Fencing." A specification of the work may be seen, and further information obtained, from Mr WM. ADAMS, the Surveyor. The Board is not pledged to accept the lowest or any Tender.
By order, FRA. JACKSON, Clerk to the Local Board.
Wisbech, 14th January, 1860.

TO BUILDERS and OTHERS.—CLYRO PAROCHIAL SCHOOL.—Persons desirous of submitting TENDERS for BUILDING SCHOOL and MASTER'S HOUSE, at Clyro, near Hay, are informed that they can inspect the plans and specifications at Mr. CHALONER'S House, Clyro, and at the Offices of the Architect. The Tenders are required to be delivered to the Architect, on or before the 1st FEBRUARY next, and no pledge is given that the lowest will necessarily be accepted.
THOS. NICHOLSON, Diocesan Architect, Hereford.

TO BUILDERS and OTHERS.—LINDRIDGE CHURCH.—Persons desirous of submitting TENDERS for REBUILDING the PARISH CHURCH of LINDRIDGE, near Tenbury, Worcestershire, are informed that the plans and specification are to be seen at the School House, Lindridge. The Tenders are to be delivered to the Architect, on or before SATURDAY, the 4th FEBRUARY next. No pledge is given that the lowest or any Tender will necessarily be accepted.
THOS. NICHOLSON, Diocesan Architect, Hereford.

[*For remainder of Contracts see next page.*]

CONTRACTS.

BURSLEM and TUNSTALL FREEHOLD LAND SOCIETY.—BASFORD ESTATE.—To CONTRACTORS. The Burslem and Tunstall Freehold Land Society are desirous of receiving TENDERS for the supply of GLAZED STONEWARE PIPES, and other articles; and also for the excavation and laying the Main Sewers, and for the formation and construction of the several Streets and Passages on the Basford Estate, Etruria, Staffordshire Potteries. Plans, sections, and specifications may be inspected at the Office of Mr. RALPH HALES, Engineer and Surveyor, Cobridge, on and after MONDAY, the 16th instant. Tenders, sealed and endorsed, to be sent to me on or before SATURDAY, the 4th FEBRUARY next.—By order, JOSIAH WOOD, Jun. Secretary.

Portland-street, Burslem, January 9, 1860.

BRADFORD CORPORATION WATER WORKS.—To EXCAVATORS, MASONS, and GENERAL CONTRACTORS.—The Water Works Committee of the Bradford Corporation will meet at their offices, in Bradford, on WEDNESDAY, the 1st day of FEBRUARY next, at TEN o'clock in the forenoon, for the purpose of receiving TENDERS or PROPOSALS for the following WORKS:—

CONTRACT M.—The EXCAVATING for, BUILDING, and COMPLETING of a portion of the MAIN AQUEDUCT or CONDUIT for conveying water to the town of Bradford, commencing at Sand-bed Beck, in the township of Burnsall, and terminating at the south end of a certain tunnel now in course of construction, called Barden Tunnel, in the township of Barden, with a certain BRANCH CONDUIT, in the township of Draughton; such conduits being of the aggregate length (including the laying of certain iron pipes for supplying the village of Burnsall, and about 675 yards of 24-inch pipes for crossing the valley of the Barden Beck) of about 7½ miles.—Plans and specifications may be seen, and further information may be had, on and after FRIDAY, the 13th instant, on application to Mr. JNO. W. LEATHER, Civil Engineer, Leeds.—By order,

W. H. HUDSON, Town Clerk,

Town Clerk's Office, Bradford, 9th January, 1860.

TO BUILDERS and OTHERS.—The Governors of the King School, Sherborne, are ready to receive TENDERS for the ERECTION of a new SCHOOL-HOUSE with Dormitories. The plans and specifications will lie for inspection in the School Library on and after MONDAY, JANUARY 16, and the Tenders are to be delivered on or before JANUARY the 30th, either to WILLIAM FFOOKS, Esq. or the Rev. H. D. HARPER. The Governors do not pledge themselves to accept the lowest or any Tender, and security will be required for the proper fulfilment of any contract that may be entered into.—For further particulars apply to the Rev. H. D. HARPER, King School, Sherborne; or to the Architect, WILLIAM SLATER, Esq. 4, Carlton Chambers, Regent-street, London.

POSTPONEMENT OF TIME FOR RECEIVING TENDERS.

MORETON-IN-THE-MARSH PARISH CHURCH.—BUILDERS willing to CONTRACT for a NEW TOWER and SPIRE to the above Church may see the conditions, specifications, and plans on and after MONDAY, the 19th of DECEMBER, between the hours of TEN a.m. and FOUR p.m. by application to T. COMMELINE, Esq. Moreton-in-the-Marsh. TENDERS (sealed, endorsed, and addressed to the Building Committee) to be delivered to T. COMMELINE, Esq. not later than TUESDAY, the 31st of JANUARY, 1860, at THREE p.m. The lowest or any of the Tenders not necessarily accepted. Information and bills of quantities can be obtained by applying to the Architects, Messrs. POULTON & WOODMAN, Reading.

WROUGHT-IRON BRIDGE.—TENDERS will be received by the undersigned, for the CONSTRUCTION of a LATTICE IRON BRIDGE, for Melbourne, Victoria, until TWELVE o'clock (noon) of FRIDAY, JANUARY 27th, 1860. Drawings and specification may be obtained on and after FRIDAY, 20th inst. at the Office of HENRY CARR, Esq. 4, Victoria-street, Westminster Abbey, S.W. to whose care the Tenders are to be addressed. The charge for drawings and specification will be one pound. They will be sent by post on receipt of post-office order for twenty-two shillings. The lowest or any Tender not necessarily accepted. To be marked outside "Tender for Yarra Bridge." W. L. STONEY.

METROPOLITAN BOARD of WORKS.—MAIN DRAINAGE of METROPOLIS, MIDDLE-LEVEL SEWER.—To BUILDERS and CONTRACTORS experienced in TUNNEL WORKS.—The Metropolitan Board of Works hereby give notice that they will meet in the Council Chamber, Guildhall, in the City of London, on FRIDAY, the 17th day of FEBRUARY next, at TWELVE o'clock at noon precisely, and will then be prepared to open TENDERS by parties who may be willing to CONTRACT for the CONSTRUCTION of MAIN BRICK SEWERS, 12 miles, 1,280 feet in length, or thereabouts (33,863 feet of this length being in tunnel), and for the EXECUTION of other WORKS in connection therewith, to extend from a point between the Northern High-Level Sewer, east of Sir George Duckett's Canal and the Western Arm of the Counter's-creek Main Sewer, near Kensal-green, in the county of Middlesex. Parties desirous of submitting Tenders may, upon payment of 3l. obtain plans, sections, specification, form of Tender, and other particulars, on application to Mr. J. W. BAZALGETTE, Engineer of the Board, at the Office of the Board, between the hours of NINE a.m. and FOUR p.m.—Tenders, addressed to the Metropolitan Board of Works, must be delivered at the Office of the Board, No. 1, Greek-street, Soho, before FOUR o'clock p.m. on THURSDAY, the 16th day of FEBRUARY next, and no Tender will be received after that hour. The Board do not bind themselves to accept the lowest or any Tender, and the party whose Tender shall be accepted will be required to provide two approved sureties for the due performance of the works. JOHN POLLARD, Clerk of the Board.

No. 1, Greek-street, Soho, January 9, 1860.

HON. ARTILLERY COMPANY.—To CONTRACTORS.—Parties that may be willing to CONTRACT for the WORKS required in extending the PARADE situate in the Artillery Ground, Finsbury, can inspect the plan, specification, and conditions at the Offices of Mr. C. F. MALTBY, Surveyor to the Company, 73, Coleman-street, E.C. where the Tenders are to be delivered on or before THURSDAY, the 26th instant, at FIVE o'clock in the Afternoon. The Honourable Artillery Company do not bind themselves to accept the lowest or any other Tender unless approved.—By order, CHARLES TAHOURDIN, Secretary.

17th January, 1860.

TO QUARRYMEN and STONE MERCHANTS.—The Dover Local Board of Health invite TENDERS for the SUPPLY to them of 1,000 TONS of BLUE GUERNSEY BROKEN GRANITE, to be broken to a size to pass through a 2-inch mesh. 500 tons will be required to be delivered before the 31st day of MARCH next, and the remainder before the 30th day of SEPTEMBER next. All the granite contracted for is to be delivered by the contractor into carts, to be provided by the Local Board, on the Quay at Dover; and all deliveries are to be subject to the approval of the Surveyor of the Local Board, who is to have power to reject any that are not in his judgment in accordance with the terms of the contract. The price to be named is to include freight, labour, and all other charges whatever (except wharfage and local dues at Dover, which will be paid by the Local Board), until the granite contracted for is delivered into the carts to be provided by the Board. Payment will be made within two months after each delivery, upon the certificate of the surveyor, that the granite delivered is in accordance with the terms of the contract. The person whose Tender is accepted will be required to execute a deed of contract in accordance with the above terms, to be prepared by the Town Clerk at the expense of the Local Board.—Further particulars may be obtained by inquiry at the Surveyor's Office. Tenders, in sealed covers, marked "Tender for Granite," are to be delivered at this Office, on or before WEDNESDAY, the 1st day of FEBRUARY next. The Local Board do not bind themselves to accept the lowest or any Tender.—By order, THOMAS BAKER BASS, Town Clerk.

Office of the Dover Local Board of Health, 68, St. James's-street, Dover, 13th January, 1860.

TO BUILDERS.—Persons desirous of TENDERING for the BUILDING of a VILLA RESIDENCE and OFFICES proposed to be built at Atherstone, in the county of Warwick, may inspect the plans and specification from the 30th JANUARY to the 14th FEBRUARY. Sealed Tenders to be sent to the Architect on 16th FEBRUARY, 1860, by TWELVE o'clock at noon. The lowest or any Tender not necessarily accepted.

Atherstone, 17th Jan. 1860. R. JENNINGS, Architect.

CONTRACTS.

TO BUILDERS and CONTRACTORS.—NEW SCHOOLS for TRINITY CHURCH DISTRICT PARISH, BURTON-UPON-TRENT.—The Committee, having obtained the sanction of the Privy Council on Education for the ERECTION of NEW SCHOOLS, with MASTER'S HOUSE, for Trinity Church District Parish, Burton-on-Trent, are now prepared to receive TENDERS. The schools are to accommodate 400 children, viz.—150 boys, 125 girls, and 125 infants. Plans and specifications may be seen at the Office of the Honorary Secretary, from whom all further particulars may be be obtained, and to whom Tenders must be sent on or before 7th FEBURARY next. The Committee do not bind themselves to accept the lowest Tender. E. B. JENNINGS, Hon. Sec.

Burton-on-Trent, January 10th, 1860.

CONSERVATIVE LAND SOCIETY.—KENTISH TOWN ESTATE.—TENDERS are invited for the EXECUTION of DRAINAGE WORKS, in the Roads on the Society's Estate in York-road (formerly Maiden-lane), Kentish-town, parish of St. Pancras. The following rough quantities are stated in order to indicate approximately the extent of the proposed works; but parties Tendering will have to take out quantities for themselves:—

9-inch Egg-oval Brick Sewer, 4 ft. by 2 ft. 8 in. including earthwork; average depth, say 13 feet	800 ft. run.
9-inch Egg-oval Brick Sewer, 3 ft. 9 in. by 2 ft. 6 in. including earthwork and four quadrantal curves of 20 ft. radius	2,600 "
12-inch Pipe Sewer	670 "
Bell Junctions, where the 3 ft. 9 in. by 2 ft. 6 in. sewers join the 4 ft. by 2 ft. 8 in.	4 in number.
Gully Cesspools (trapped)	20 "
Ditto existing, to alter	4 "
Ventilating Shafts	12 "
Side Entrance	1 "
Cutting and making good Gravel Roads	3,650 ft. run.
Surplus Earth to be removed	2,000 cu. yds.

The plans, sections, details, and specification will be seen on and after WEDNESDAY, JANUARY 25th, at the Office of the Society's Surveyor, Mr. JAMES WYLSON, 33, Norfolk street, Strand, W.C. Tenders to be sent in on or before SATURDAY, FEBRUARY 4th. The Committee do not bind themselves to accept the lowest or any Tender.

33, Norfolk-street, Strand, W.C. January 19, 1860.

TO ENGINEERS and OTHERS.—The Crown Estate Paving Commissioners do hereby give notice of their readiness to receive TENDERS from persons willing to enter into a CONTRACT for the WORKING and KEEPING in REPAIR of the STEAM-ENGINE, in the Regent's-park, used in connection with the supply of water for watering the roads.—Printed specifications and forms of Tender can be obtained upon application to me here, where sealed Tenders addressed to the Crown Estate Paving Commissioners, and endorsed "Tender for Steam-Engine," are to be delivered at or before ONE o'clock, on WEDNESDAY, the 1st FEBRUARY next.

FRANCIS ADAMS, Clerk to the Commissioners.

1, Whitehall-place, January 16, 1860.

TO BUILDERS.—Persons desirous of TENDERING for the ERECTION of St. Andrew's PARSONAGE-HOUSE, Paddock Wood, Brenchley, Kent, may inspect the plans and specification at my Office on and after the 25th instant. Tenders, sealed and endorsed, "Tender for Paddock Wood Parsonage," are to be sent in on or before FEBRUARY 8th. The lowest or any Tender will not necessarily be accepted.

Brenchley, Kent. JOHN M. HOOKER, Architect.

THE BOARD of WORKS for the ST. GILES DISTRICT.—STREET WATERING.—The above Board are willing to receive TENDERS for the HIRE of about FIFTEEN strong useful HORSES and DRIVERS, with all necessary harness, &c. complete, for the purpose of working the water-carts of the district. Further particulars may be had on application to Mr. WILLIAM TREHEARNE, Surveyor, at the Offices, 199, Holborn. Security will be required by the Board for the due performance of the Contract, and payments will be made monthly. Tenders to be delivered on or before the 31st day of JANUARY inst. not later than TEN o'clock in the forenoon, and no Tender will be received after that time.—By order of the Board, ROBERT FINNIS, Clerk.

Office, 199, Holborn, W.C. Jan. 17, 1860.

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The Builder.

VOL. XVIII.—No. 885.

The Museum of Practical Geology: its Uses to Architects.

WHEN it is said that the value of the mineral produce of the United Kingdom, exclusive of building stones and clays, was, for the year 1858, 31,266,932*l.*, or perhaps half the value of the same kind of produce of all Europe, including the British islands, it will be seen, without reference to the practice of architecture, of what importance is the institution in Jermyn-street; which, under the general designation of the Museum of Practical Geology, comprises, besides the Museum, the offices of the Geological Survey of the United Kingdom, the Government School of Mines, and the Mining Record Office. But there is no public educational institution, which should be of greater interest to the architect. Besides affording means to the student, of acquiring the essential knowledge of geology as a science; it contains an important collection of samples of building stones, and an extended series of metalliferous and other mineral products, with examples of their application in art. Many years ago, when, as the Museum of Economic Geology, the nucleus of the present collection was located in Craig's-court, and was comparatively little known, we drew to it the notice of our readers, and to its capability of aiding in the advancement of architecture and building.* Subsequently we described the general features of the new structure in Jermyn-street; afterwards,† we gave a view of the interior, an elevation of the entrance as designed (and now perhaps the best work of the kind in the metropolis), and some details of the construction of the iron roof; and more recently, at various times, we have paid attention to the collection, and to different objects of the establishment. We propose to post up our information to the most recent date, and to inquire what points there are in which the value to our profession, of such an institution, may be further developed.

The additional matter, educational and illustrative of the earth's structure, of late put forth, is to be found in the publications of the establishment, rather than in the museum. In the latter, much has to be done to render the collection both instructive to the public, and immediately serviceable as regards the knowledge of elementary geology, and that of the durability and cost of building materials. The maps and sections of the Geological Survey are now completed for Wales and Monmouthshire, and for the counties of Cornwall, Devon, Dorset, Gloucester, Hereford, Salop, Somerset, and Worcester; and those for Wiltshire are about ready. The maps, most of our readers know, are those of the Ordnance Survey, geologically coloured,—those on the scale of 1 inch to a mile. What are called erroneously "the *horizontal* sections," and which are cross sections along an extended line of country, are drawn to a scale of 6 inches to the mile horizontally and vertically; whilst the "vertical sections" are to a scale of 40 feet to an inch, and illustrate details, such as the thickness of each bed of coal, which it is impossible to give in the "horizontal sections." There is also in course of publication, an Index Map on the scale of four miles to an inch; and which appears to have extended to parts of certain counties not included in the sheets to the larger scale. For Ireland, maps are published containing the counties of Wicklow, Carlow, Wexford, Waterford, and great part of Cork and Kilkenny. The survey of Scotland is in progress. Specimens for the museum are collected during the several surveys. The collection, however, besides including specimens from foreign countries, extends, as will have been seen, to objects other than the illustration of the nature of rocks, and of remains of organic creation in them. But the main field of the institution is the geology of the British isles, with the commercial value of their mineral products. The complete illustration of geology is supposed to be one of the objects of the British Museum; the Palæontological collection, in Jermyn-street, however, is very extensive, and is not less interesting than that in the other institution, though not including so many remains of animals of great dimensions. Besides the maps and sections, the publications of the institution in Jermyn-street include "Memoirs of the Geological Survey, and of the Museum of Practical Geology," forming part of which are the annual "Mining Records," or mineral statistics for each year, and papers on the geology of certain districts, such as the Isle of Wight and Cheltenham, and on the iron ores of Great Britain. There are also some earlier publications, including Sir Henry de la Beche's Report on Cornwall, Devon, and West Somerset; a catalogue of the specimens of British pottery and porcelain; and a paper, in the memoirs, on "The Composition of some Building Stones." There are also now published, A Descriptive Guide, and a Catalogue of the Contents of the Mining Record Office, both by Mr. Robert Hunt, the keeper of mining records; and "A Descriptive Catalogue of the Rock Specimens," &c., by Mr. A. C. Ramsay and others. Catalogues, severally, of the Palæontological collection, the minerals, and the building-stones are in preparation. The "Guide" and the "Descriptive Catalogue" are essential to those who wish to study the collection: they are sold at a very moderate price; and, though we have suggestions to offer, some of which might have been unnecessary with different arrangement in one of these works, both of them are creditable to those by whom they have been prepared.

What the institution mainly requires is, a a different arrangement of the specimens in the museum, that is, one more prominently and popularly illustrative of the order of succession of rocks. The present arrangement is intended to illustrate the lithological character, the mineralogical and commercial value, and the organic remains; but these intentions might be better carried into effect. The distribution of the rocks topographically is exhibited by the published plans and sections. The general visitor will neither read through in the museum nor be induced to refer to a volume of 375 pages, like the Catalogue of Rock Specimens; and, for the geologist, or architect, a more lucid arrangement than that which exists at the museum is needed, in order that the formation, or the class of specimens looked for, may be readily found. We do not say that the object we have in view has been disregarded, but only that the arrangement is not sufficiently obvious in the museum, or in the catalogue above named, where it is limited to a list of strata, with cross references to the specimens and to previous pages.

The circumstances under which the collection has been formed seem to have led to preponderant attention to the organic remains as specimens, and to the minerals in their applications in art and manufactures, till the building is now inadequate for that arrangement of the whole contents, or of the specimens of rocks, which would be best both for the popular and educational objects, and for others. To the illustration of the *nature of rocks*, indeed, considerable attention has been paid by Professor Ramsay, through arrangement of specimens in the second gallery, and by means of his catalogue. In these respects, however, there is room for improvement, with a view to the objects we have mentioned; and, regarding what is most important to the architect, apparently little has been done at the museum, since the specimens procured by the commission, prior to the building of the Houses of Parliament, were contributed to the museum at Craig's Court. The report of the commission bears date 27th August, 1839. Since that time a considerable amount of experience as to durability has accrued, which should be placed on record; many kinds of stone have newly come into the market in London and the large towns, and questions are suggested as to most of the specimens in the lower hall, to which there is no answer at Jermyn-street. A list, already referred to, of the quarries of the kingdom, with the prices of stone and other information, is understood to have been some time in preparation; and the want of the information of this kind, as well as the desirableness of a stratigraphical illustration in the general collection, are, we may say, admitted. We hope that the catalogue will include the cost of labour and carriage.

The principle to be adopted, as we apprehend, in a geological museum, and *prominently* in arrangement, should be the division of the whole of the specimens, as by the stories of the building, according to the main divisions of strata, primary, secondary, tertiary; by the cantilever galleries, as the subdivisions, lower and upper Palæozoic, Eocene, and others; by distinctions, say in the cases, as the systems, Cambrian, lower and upper Silurian, Devonian, and so on (the latest in order of time being, as now, in the upper part of the building), whilst the separate strata and their remains would fill the separate shelves. The existing arrangement at Jermyn-street, of the Palæontological collection, and that of the catalogues, does little to supply this. The space at the top of each case of the collection named, which is given to drawings of restored organic remains, would be better appropriated to drawings of the strata. Such drawings are now confined, nearly, to some sections, and those not very clear, showing the arrangement of the igneous rocks. The visitor to the museum at present sadly wants the means towards a mental synopsis, primarily, of the subject and the collection, other than is supplied by mere names,—though after one visit and elaborate study of the Guide and Catalogue, he would be able to spend a profitable day, and learn much. Ideal vertical and cross sections, as well as the ordinary maps of the British islands, are either wanting; or are not easily to be found. The evil is, that a catalogue is required: yet there is not a catalogue which supplies the key to the knowledge of the strata and the actual arrangement; and the slight differences which will be observed between the grouping of the rocks in Mr. Hunt's Guide (page 282) and Mr. Ramsay's Table of Strata, or in names, will occasion difficulty. One authority uses the term Miocene as that of a group, whilst the other omits it altogether; and the student who happens to go to Ansted for explanation, will find that that author applies the term to the same strata which Professor Ramsay designates "Older Pliocene." The Table of Strata, mentioned, might be improved in other respects; but discrepancies between what emanates from the same department, should, if possible, be avoided. Some of the specimens are marked as of the Quaternary formation; and others, as Post-Pleiocene. Either designation (or Pleistocene) would be of advantage, if introduced; but we find them only in the museum, and not in the catalogues. The name Palæozoic remains over recesses which are filled with remains of recent date. Mistakes on the part of some visitors, and loss of time to others, result. The building, now too small, would have been found well contrived for its purpose, had not the mineralogical and palæontological departments, from particular and important reasons, absorbed so much space. Light, however, at this time of the year is wanting to the cases in the recesses, though said to be in excess in summer; and we may mention (though it is easier to do so, than always to avoid the inconvenience) that the reflection in the plate glass of the table-cases

* Vol. III. 1845, p. 87.
† Vol. VI. 1848, pp. 522, 558, and 559.

interferes much with examination of their contents.

The desirableness of the stratagraphical illustration of the rocks is so far admitted by Mr. Ramsay, that he even intimates that before another edition of his catalogue is issued, it may be well to arrange the rock-specimens on this principle. We would, however, have the arrangement obvious in the whole museum—without omitting the illustration of mineral applications, of the nature of rocks, and of joints and cleavage. In the Scarborough Museum, if not different from what it was some years ago, such an arrangement as we propose is carried out better than in the museum in Jermyn-street; though it is confined mainly to the Yorkshire coast. The stratification of the whole coast is depicted above the cases; and the fossils are laid generally, on shelves inclined to represent the inclination of the strata, in corresponding positions beneath.

The catalogue of building-stones will no doubt supply information which cannot be obtained from the specimens in the lower hall. Excepting the specimens of marbles which are worked into pedestals and vases, few of them can be sufficiently examined. The slates are heaped together, almost out of sight. But, besides specimens to be preserved in-doors, the architect desires to see others, worked into mouldings, under the action of the weather and exposed in all different positions relatively thereto. No statements of comparative advantages can be satisfactory till tests of this nature are applied, authenticated by a public department. The institution of the commission of 1839 was an excellent measure. Except by the establishment itself of the Museum, and support of its associated undertakings, the Government of this country has hardly at any time seen the value of promotion in a like manner of scientific researches. We regret, therefore, that specimens were not placed some years ago under the test of a London atmosphere. It quite deserves the consideration of the officers of the Museum and the Geological Survey, whether what we speak of should not be attempted now, and Government be moved to provide means for obtaining a site or space for the experiments. Very little space would be needed; but it could hardly be found at the building in Jermyn-street as it exists. The space should be within the populous part of London; whilst for sake of contrast, there should be similar means for placing specimens at some locality in the country. Had something of this kind been done twenty years ago, we should now have possessed knowledge of building-stones suited to London, which would have preserved us from some of the unfortunate failures that have come to light,—allowing that the check often is required over what is sent from a quarry. Experiments might at the same time be made to test effect of preservative processes. A long piece of stone should be worked with mouldings, and then sawn into short lengths (to be marked and registered) in order that the effect might be contrasted, of different processes, and of each with the stone in its ordinary state. The same system of testing by the influence of the weather, could be extended to the different cements, bricks, and terra cottas, and to the metals and their electro-chemical coatings. The "Descriptive Guide" to the Museum says, referring to Keene's cement, that if half a pound of copperas be added to the solution of alum, "the resulting paste has a fine cream colour, and the hardened mass *is said to resist the action of the atmosphere.*" Why should there be left any doubt in the matter? There is need of a good and cheap vehicle for external sculpture.

Though we have shown that the museum in Jermyn-street might be made of greater value, we must repeat that both the collection and the catalogues are very creditable to those whose names are attached. The rock-specimens and the Catalogue by Professor Ramsay, assisted by Mr. H. W. Bristow and others, show "the external characters of such rocks as conglomerate, sandstone, grit, limestone, shale, schist, gneiss, granite, the different kinds of trap, lavas, volcanic tufas or ashes, and, indeed, all the varieties of stony substances that are of common occurrence;" and the names of the places whence the specimens were obtained are marked upon them. In England and Wales, the general nature of rocks is as follows. The Cainozoic or tertiary stratified rocks, which begin from the south-east portion of the island, and include the neighbourhood of London, are mostly formed of gravel, sand, and clay, with a little soft limestone; and the Mesozoic, or secondary rocks, extending across the island from north-east to south, also circumscribing, as by the chalk, the tertiary rocks, and coming to the surface even in the south-east, as in the case of the Wealden clay of Kent and Sussex, are composed of chalk, clay, soft shale, oolitic and hydraulic limestones, marls, sands, and conglomerates, ending with the New Red Sandstone formation. The Palæozoic, or primary stratified rocks, beginning with the Permian or magnesian limestone system, and including the Carboniferous, Devonian, or Old Red Sandstone, Silurian, and Cambrian systems, include a great variety of mineral substances: in the Carboniferous rocks are shales, ironstones, sandstones, fireclays, coal, and limestones; the Old Red Sandstone has red marl, sandstone, and conglomerate; and the Silurian and Cambrian rocks, the latter much distorted and altered by volcanic action and the rise of the igneous rocks, are in great part of mudstones, grits, and slate, with occasional shales, limestones, and beds of conglomerate, sandstone, and grit. Scarcely any portion of our island presents apparently such difficulties as Wales; yet the arrangement of the strata in Caernarvonshire and Merionethshire, seems to be now as clear as if actual cuttings had been made. To Wales and Shropshire, the "Siluria" of the Director of the Museum is chiefly devoted; but Professor Ramsay has been one of the most recent and useful labourers on the Snowdonian range. There are local peculiarities out of England, in the nature of the contemporary rocks; for example, the secondary limestones of the Alps are often crystalline.

It would be impossible to identify strata by the appearance alone; and it is at this juncture that the value of palæontology is seen. By the organic remains, the uniform succession has been made manifest; and it is shown that however strata may be absent in any locality, the order of succession is otherwise never varied or inverted. When we learn that "it would require 170 years to gather one inch of anthracite coal, and the enormous period of 122,400 years to accumulate 60 feet of the same;" that the formations are measured in thickness by tens of thousands of feet,—the Cambrian rocks in Shropshire having alone been estimated at more than 26,000 feet,—and that, at the base of the vast depth, remains of organic creation are found,—we look with awe at the evidence of the ages over which the work of nature has extended—ages to which the 6,000 years of the existence of man are moments in comparison. Even should it be proved, as lately supposed, that this existence commenced within the period of the tertiary deposits, we have still the evidence, and in our own island, that ages before that time, the earth and sea teemed with countless forms of animal and vegetable life throughout a succession of changes of climate, and a long series of gradual depositions modified by subterranean forces, and by the action, more recent, of glaciers and floating ice.

One of the cases in the upper gallery illustrates the phenomena of this glacial action, as indicated in North Wales, Lancashire, and other parts of the island, and as now going on in Switzerland. The volcanic action is illustrated by specimens from foreign countries, as well as by specimens from the igneous or altered rocks of Wales and Shropshire. Gneissic rocks and granites are of every geological age. One portion of the collection illustrates the phenomena of alteration and metamorphism of rocks,—by fire, and the intrusion of the igneous rocks among various kinds of strata. From the effects of heat, besides distortion, the new combinations called metamorphic are developed, as mica slate, and all the rocks of the gneissic family. Serpentines are metamorphic rocks. The remainder of the specimens in this department of the museum, illustrate the nature before spoken of, of the substances of which stratified rocks are composed. There are specimens showing the manner in which depositions of carbonate of lime (limestone), as at the present day, from a bi-carbonate of lime in solution, result in calcareous tufas, and stalactites and stalagmites; and others illustrative of formations of beds by chemical action, such as those of gypsum and rock salt. There are many other specimens illustrating the formation of stratified rocks, chemically and mechanically. The manner of chemical deposition has just been adverted to. The mechanical process, which has largely predominated, goes on by the deposition always taking place in the sea, lakes, and estuaries, and the abrasion of the sea-coast. Strata are thus formed, sometimes of sand, mud or clay, or lime, separately or admixed, and sometimes almost exclusively of organic remains. The specimens show the structure of conglomerates, and breccias, grits, sandstones; sands, some shelly or otherwise calcareous; marls, clays, shales, slate, and coal, as well as marks on what was part of the sea-bottom, of ripples and currents, and of the feet of animals. Separate cases are devoted to the siliceous bodies, and concretions and septaria, contained in rocks of various kinds and all ages; and to the limestones of various periods, arranged with reference to their qualities, and the iron-stones.

In the Descriptive Guide, by Mr. Hunt, facts are given respecting the stones and other materials, of which there are specimens in the entrance-hall. The information will be useful; but it does not diminish the argument for something further. The collection on the principal floor is very fully described in the same work. It comprises specimens and models illustrative of the British metalliferous minerals and metallurgy, as of copper, tin, bismuth, cobalt, nickel, arsenic, manganese, uranium, zinc, brass, German silver, antimony, cadmium, silver, gold, lead, mercury, platinum, and iron and steel, and other metals and alloys, and illustrations of mineral lodes, and of processes of mining and smelting. Models of machinery and mines are found on the same floor. The foreign and colonial minerals are classed separately. The specimens include objects of great beauty, as rock-crystal, agates, and precious stones. Iron is shown, both in the ores and as applied in ornamental castings; and the alloys of metals, as copper with zinc, copper with tin, and others, are shown applied to works of decoration and sculpture. The manufacture of gun-barrels and sword-blades is represented in two of the cases; the process of electro-metallurgy in another; and there are Chinese bronzes in a third. Besides this class of works, however, there are on the same floor an extensive series of works of pottery and porcelain, both of ancient and recent date, and other specimens of ancient and modern glass, and of mosaics and enamels. In these departments the materials employed are shown, and information is given as to the manufacture; and of the specimens, many of them are individually interesting historically and as works of art. The composition of several of the specimens, as of those of ancient glass, is given from analyses made at the museum. Bronzes (of the number brought from Assyria by Mr. Layard) which were constructed for some purpose of support, were found on examination to be cast with the bronze round a core of iron. There will also be found fragments, from the bed of the sea, of articles of iron, parts of wrecks, showing the cementitious incrustation which the metal acquires when in contact with gravel,—a natural process which might be called preservative, and is of great interest to architects and engineers, considering the importance just now of the question, to which on other occasions we have made reference, of the durability of iron in similar situations. In another part of the museum (in the upper gallery) is a specimen showing the rapid decay of the same material when exposed to the alternate action of the air and sea, as by rise and fall of tides from 1811 to 1853. The iron appears to be rapidly destroyed by the

oxidation, ordinarily "leaving a spongy mass of graphite, or impure carbon," but has (as shown in a neighbouring specimen in the same gallery) an "agglutinating power" while undergoing oxidation as in the bed of a river. The subject referred to, however, requires further inquiry. The cramps or straps from the foundations of old Westminster-bridge have been brought up, not greatly altered by oxidation or corrosion.

In illustrations of the structure and products of the earth, and the applications in art and manufactures, and even in the wonderful remains of extinct life, the museum in Jermyn-street, it will be seen, contains much that is of immediate interest and value to the architect. The institution may be made more valuable in points which we have referred to; but by the publications, and the specimens and the geological information continually being obtained, as well as by the lectures and the library, it deserves more attention from our profession, perhaps, than it has gained. The library includes, we may say, upwards of 7,000 volumes, and periodicals, English, American, and Continental, relating to science, as they are published, to which on special application, stating the object in view, access may be obtained. There are also laboratories, metallurgical and chemical; and the College of Chemistry, in Oxford-street, is attached to the Museum.

THE NORMAN ARCHITECTURE OF CANTERBURY CATHEDRAL.

THE following is the lecture (referred to in our last) which was delivered before the members of the Architectural Museum, in the Lecture Theatre of the South Kensington Museum, by Sir Walter C. James, Bart., the subject being "The Norman Architecture of Canterbury Cathedral." The lecture, as we have already said, was illustrated by many excellent drawings and diagrams:—

It is not possible to add to what such men as Professor Willis, or Mr. Fergusson and Mr. Parker have detailed upon the subject of Canterbury Cathedral, in their various valuable works on Mediæval architecture. It is, perhaps, the province of the lecturer rather to condense what already exists, than to seek too far for original matter, and to give information which, though possibly imperfect, may yet be, as far as it goes, correct, and may, therefore, lead the young inquirer to fresh sources of knowledge, where he may work for himself.

It has been remarked by a modern writer of considerable eminence and talent, that "architectural works enriched by the subordinal arts of sculpture and painting frequently afford the only traces which extinct nations have left upon the earth of their history, their condition, their manners, or their religion." Unquestionably, even in times when the historian has regularly transmitted authentic records of fact, they tend to throw much light upon many transactions otherwise doubtful and obscure.

A description, however, of a single building seldom excites any interest, except in the professional architect or antiquary; and, although there attaches an exceptional interest to Canterbury, on account of the many historical associations with which it really teems, yet, in an architectural lecture, it is perhaps best to make it a type of others, and, as it were, the symbol of a particular age.

For this reason, it may be permitted to look upon Cauterbury for the purposes of this lecture as a fair exemplar of our cathedrals up to the beginning of the thirteenth century, when the Pointed or Early English style may be considered to have spread its roots in the soil, and given promise of that rich harvest of architectural excellence which culminated perhaps in the Decorated period.

In considering the state of society which prevailed during the reigns of our Plantagenet kings, we find a clergy united by strong ties of allegiance to Rome as the "mater ecclesiarum." We have a dominant race of conquerors of Norman blood, speaking the French language, and owning the sovereign sway of Norman princes. But we have also, as it were, at the bottom of the scale, an Anglo-Saxon nation gradually rising into importance, and modifying by its own energy the two other elements to which I have alluded.

Thus, it is related that Henry II., on taking leave of the prior of some convent where he had passed the night, bade adieu to the holy father in the Latin language; while at the same time and place he spoke to his knights and equerries in Norman-French; and to the beggars round the gate, who were asking for alms, in the Anglo-Saxon language.

Indeed, this condition of our English tongue lasted for two centuries at least, after the time to which this lecture must limit its inquiry.

For we find in Chaucer:—

"Let the clerkes endyten in Latin, for they have the property in science and the knowinge in that faculty, and let Frenchmen in their French also endyten their queynt termes, for it is kindly to their mouths, and let us show our fantasyes, in such words as we learned in our dames' tongue."

It was not till a century and a half after the building of the Choir at Canterbury, in its present form, that the pleadings of our law courts were required to be in English, and not as heretofore in French, and that all schoolmasters were ordered to teach their scholars in English, and not in French, as they had been used to do.

We should then, arguing *primâ facie* from such a state of society, naturally suppose, that in the architecture of the period to which our attention is directed, we should find a strong but not preponderating Roman element, derived from Christian tradition, and the existing buildings in the great capital of Western Christendom. We should probably have a strong Norman element, intermingled with one of purer French origin; modifying that Romanesque or Romane style which we find in Southern France and the Rhineland, to the exigencies of a northern climate and a northern race. Lastly, we should have our own national forms and English characteristics; our own vernacular developments, stamping, as it were, the impress of the prudent, painstaking English mind upon these grand mediæval churches. Such a statement, it will be found, does not deviate much from the truth. It will be the object of the present lecture to analyse the subject from this point of view, and successively to present to your notice, as far as the limited time at our disposal will permit, an outline of the effects which these different elements have had in bringing to its normal type the English cathedral, of the transitional æra, as we find it in the eastern parts of Canterbury, after the introduction of the Pointed arch, both in France and England, but prior to the full development of the Pointed style, —the Cathedral such as it was at the end of the twelfth century.

Roman Element.—Rome, as it is the prime fountain whence the stream of modern history issues, so is it the true source of our ideas upon art. To trace these latter to their origin, we may have to go back even to the time of Augustus.

The whole style of Roman architecture, which has been well described as a compromise between the vaulted architecture of Etruria and the trabeated architecture of Greece, was of a transitional character. Grand even in her decay, the imperial city was sowing broadcast over the world fruitful germs of truth, which were doomed to reach perfection under the fostering care of her subject colonies, fated in their turn to become the nursing fathers and mothers of the Christian Church. In the time of Augustus we have forms almost purely Greek. Paganism stamps its genius upon every edifice. In the time of Constantine we have types almost purely Christian.

The temple of the Romans, such as we find it at the dawn of the empire, consisted of an external arrangement of columns without vaults or arches, the cell or internal part devoted to a statue or idol of the heathen god. It was usually darkened, and wholly unsuited to the purposes of the Christian ritual. Towards the end of this period Roman architecture had become an internal architecture, plain in its exterior almost to rudeness. The columns which had adorned the heathen temple were taken, and with "fatal facility" transported or adapted to the interior of the Christian church. A Basilica of the first age after Constantine is almost as well suited now as it was then to the forms and ceremonies of the Christian ritual.

What then were these buildings—basilicas, as we have been accustomed to call them? By the side of the heathen temples (which it may be remarked *passim* never reached the same importance in Rome, that they did in Greece), there were other buildings, courts of justice, halls of commerce (may we not say), providentially well suited to the wants of the young Christian republic.

These buildings seem to have been the outward symbol and expression of much that Rome has bequeathed to us, of real value, her ideas of law. That Christianity which adorns all that she touches should have taken up her dwelling in such tabernacles as these, is perhaps a theme for thankful praise. For not only do we find everything well suited to the touching rites of the simple primitive ritual, but it seems also (if the phrase may be allowed) that Christianity, by making her home in these scenes of every-day work, declared her great office to be, not so much to debar men from "the world" as to sanctify "the common things," as they are well called, of our daily life by turning them to the highest and noblest of all ends.

The great charm of the buildings to which I refer consists in the unity of idea with which they were invested.

As to the roofs of these buildings—one of their most important features,—six out of seven which we know were covered with timber roofs: the seventh, that of Maxentius, was vaulted.

[The lecturer then described the Christian Basilica. This was seldom, if ever, upon the site of the heathen Court of Justice. Two motives influenced this removal: first, a desire to have buildings *solely* given up to religious uses; secondly, a veneration for the graves of the early martyrs.]

These details have taken up more time than seems fair in an address intended to illustrate Mediæval rather than Primitive Christian architecture, but they connect themselves more readily than might at first be supposed with England and Canterbury.

"When Augustine" (the first Archbishop of Canterbury), says the venerable Bede, "assumed the episcopal throne in that royal city, he recovered therein, by the king's assistance, a church which, as he was told, had been constructed by the original labour of Roman believers. This church he consecrated in the name of the Saviour, our God and Lord Jesus Christ, and there he established an habitation for himself and for all his successors." Now the church so rebuilt by St. Augustine, and subsequently repaired by other bishops, is known to have been copied from the model and immediately upon the plan of that of St. Peter's at Rome. Hence it has been well written, "The Christian architecture of Rome and the Teutonic Romanesque are in the nature of cognate languages: but in each there is a diversity in the inflections—a nationality in the phrase."

The copy is, to a certain extent, a faithful copy; but there is an originality in the touch of the artist.

It is worth noting that Eadmer the Singer, whose account of the building we have, had actually seen St. Peter's, and accompanied Anselm thither about A.D. 1100. He was, therefore, well able to judge of the resemblance, and pronounces it to be good.

[The lecturer then referred to, and explained the plan of St. Peter's, referring particularly to—

1. Its apse at the west—polyandrum and confessionary.

2. Its high altar, under a ciborium or canopy, which rested upon four pillars of porphyry.

3. He then noticed the columns of Parian marble, placed in front, in two rows, ornamented with vine leaves. Tradition states that they came from Solomon's Temple.]

Before quitting the Roman element it may be permitted to ask, first, in what points does the Saxon cathedral coincide with St. Peter's; and, secondly, in what points is the Roman element persistent. What Roman characteristics have been carried forward into the Mediæval cathedral?

1. The position of the crypt extends only under the presbytery and altar end of the church.

2. The entrance into the crypt descends into the confessionary.

3. The position of the matutinal altar is the same.

4. The choir of the singers is extended into the nave—an arrangement quite analogous to that adopted in San Clemente and the other Roman churches.

At the west end was a lady chapel, with an episcopal throne. Professor Willis thinks that this was really the altar end of the church, in imitation of St. Peter's.

In the Church of Laufranc, to which attention must next be called, we still have, not perhaps all these characters, but—

1. The apses, repeated not only in the presbytery, but in the transepts, and afterwards in the chapels of St. Anselm and St. Andrew. This form is rare in Englund.

2. The central nave and aisles and clerestory always persistent forms.

3. The wooden roof, the general style in England.

4. Some points of ornamentation.

Norman and Norman-French Element.—We may consider the Norman style of architecture to commence with the Conquest. In the account which Gervase gives of the burning and repair of the cathedral, we have a very full account of this church of Lanfranc. The archbishop erected it new from its foundations in seven years. It is upon nearly the same plan as the Abbey of St. Stephen's at Caen, which was built under his direction, begun in 1064, and dedicated in 1077, after his appointment to Canterbury. The present nave, though built in the fourteenth century, is thought with good reason to stand on the foundations of Lanfranc's church. An important part of the building, one of its western towers, was destroyed as late as the year 1834. It is uncertain whether any of the present crypt may be fairly attributed to Lanfranc.

Professor Willis has undertaken the somewhat difficult task of developing three states of the eastern part of the building. First, as left complete by Lanfranc; secondly, as altered and enlarged by Anselm and his Priors; and thirdly, as it came out of the hands of William of Sens and William the Englishman after the fire of 1174.

It is not easy to understand the motives which led to the destruction of Lanfranc's choir so short a time after its completion. It is not impossible that the Archbishop, being intent on the restoration of a stricter discipline in his monastery, and the publication of new statutes to the whole Benedictine order of England, neglected, in some measure, the building of his cathedral in an appropriate style of splendour. Certain it is, that Gervase passes over this somewhat remarkable incident—the destruction of its eastern end —in a mysterious way. We may, perhaps, also find a motive for this change in the vanity of the monks, who wanted more shrine room for the display of their gradually accumulating relics. The simplicity of the earlier Christian ritual was giving way to a more pompous liturgical worship. From the ritual, as has been well said, arises the temple, and the temple again becomes the commentary on the ritual. The form and aspect of the structure appear as evidence of the doctrines taught within its walls.

Of the work of Ernulph and his successor Conrad, considerable portions still exist. From the admirable treatise of Gervase, and the clear explanations which accompany Professor Willis's exact translation, it is easy to trace these parts of the building. The choir itself was long called the "Glorious Choir of Conrad." The murder of Thomas à Becket took place when the cathedral was in the state it was left by Conrad, and it is worth notice how much of the primitive style of architecture, and especially the arrangement of the Presbytery, still remained. The fire took place some years after his death, and appears to have been accidental. It is supposed that when he was murdered he was about to take his seat in the pontifical chair, prior to vespers. Undoubtedly he might, had he chosen, have escaped his pursuers by concealing himself in the crypt, with which he was well acquainted.

After the fire, which was the immediate cause of the rebuilding of the cathedral, there would, probably, be no lack of funds for its reconstruction on a splendid scale. The contributions of pilgrims, whether princes or peasants, would furnish these means. French and English artificers, we are told, were summoned to give their opinion on the best plan. Even these differed in opinion. "However, amongst the other workmen, there had come a certain William of Sens, a man active and ready, and as a workman, most skilful, both in wood and stone. Him, therefore, the monks retained, on account of his lively genius and good reputation, and dismissed the others, and to him, under the providence of God, the work was committed."

I exhibit a drawing of the cathedral in section, which will give a good idea of what the choir was in the time of Conrad, before the fire, and, as enlarged and beautified by William of Sens—as, in short, it now exists. The whole of the Trinity Chapel, and the crypt underneath it, must be considered the work of English William, and is new from the foundations. Of this, more hereafter. As there remain, however, in the western parts of the choir and transepts some portion of the early work of Ernulph and Conrad, it may not be amiss to mention one or two of the tests by which they may most readily be distinguished.

1. By the style of the masonry. The columns, according to Gervase, were raised 12 feet in height, and exactly at that height a new style of masonry begins.

2. By a different and more elaborate base to the columns.

3. By a nobler and more ornate style of carving.

There are, however, other architectural features introduced by William of Sens in the vaulting and pier arches, and generally in structure, which require some notice, and as it seems conceded by architects and antiquaries, that the Choir and Trinity Chapel are the earliest specimen of the Pointed style which can be authenticated in England, it may be permitted to make a short digression, not upon the subject of the Pointed arch itself, so much as, upon the general character which the Round arched architecture of France and England was assuming at the end of the twelfth century. And here, perhaps, I may venture to trouble you with a quotation from the earnest and eloquent pen of the late Mr. Hope:—

"A fortuitous concurrence of circumstances has made many a man invent that which he had not the means to apply, of which he saw not the full use and application. Many a discovery has taken place for the first time at a period when little wanted, it conferred no distinction upon its author, and no benefit upon others, when, like a fire kindled without proper fuel to feed the flame, it again went out, or for many ages smouldered in unperceived obscurity, till, fresh wants and fresh means fanning the latent spark, blew it up into a blaze, when the genius to which it first was owing had already long been forgotten in the darkness of the grave. And thus, for aught we know, it may have fared with the embryo of the arch. If even by some fortuitous meeting of materials, in peculiar relative situations, the embryo of the arch should first have been found in independent Greece; it there remained in a manner dormant and sterile. It received no development. It became not in her edifices a marked feature calculated by its importance to change and remodify the whole face of her architecture."

What has here been said of the Round arch may, with equal truth, be asserted of the Pointed. We find pointed arches in the East, in Sicily, in Greece, in very early times; but it is not till about the middle of the twelfth century that we discern in France examples of what we may fairly term the Pointed style. Thus we arrive at what may be considered something like the true theory —viz., that it is a great mistake to separate the Pointed from the Round-arched style; and that it is alike more natural and more true to look upon, the former merely as the offspring of the latter, perhaps, speaking more correctly, as itself in a more forward state of its development. At St. Denis, the work of the Abbé Suger, whom a modern French theory has stamped as the inventor of the Pointed style, we find work of a decidedly Romane or Romanesque character, and yet intermingled with the free use of the Pointed arch.

I exhibit a view of one of the chapels at Noyon, which was built by Bishop Beandouin, the friend and contemporary of the bishop who built St. Denis. It is notable for a certain general resemblance to Canterbury. I now come to Sens itself, of which I exhibit some details. Their similarity to the architecture at Canterbury will at once be recognized. Of this Mr. G. Gilbert Scott said, in a lecture at the Royal Academy:—"Though a cathedral of the second magnitude, and much injured by subsequent alterations, I know few which have a nobler or more impressive aspect. Even the soaring interior of Amiens, which I chanced to visit a day or two after, did not efface from my mind the sterner grandeur of Sens," and, with the true liberality of thought which marks the English mind, the same architect is reported to have observed to a friend:—"Well! if, as the French say, we may find here the true original of our Pointed style, at least we must admit that we had a noble parentage."

Admitting, then, most fully the interpolation of French work at Canterbury, we must be careful to distinguish,—first:—

That it is not to France as a whole that we concede precedence at this particular epoch, for there are many parts of France where the development to which we allude was specially tardy; but rather to that part immediately round Paris, the domain of her ancient kings. The immense influence gained at this time by the French monastic establishments, and the simultaneous increase of the royal power, brought about the great epoch for building in France.

Secondly. Although this admission with regard to France is just, it should be added that there were in England the same causes at work which were working in France, and which, in all probability, would have led to like results. It would be a narrow view to take, and quite an unnecessary concession, that all other nations followed simply in the wake of the French. The communications going on through Europe caused each nation to know perfectly well what was passing elsewhere. The tendency to refine and elevate, to substitute grace for sternness, and a sense of beauty for a sense of power, is manifest about this time in all the countries in which the Romanesque architecture prevailed. In all we find the simplicity of its earlier works yielding to that refinement of form, that dignity of elevation, which science and education produce. The barbaric sentiment gives way, and the rude vigour of the early round-arched Gothic is eclipsed by the mechanical skill and the greater taste of the architects of the thirteenth century.

The question remains to be discussed, how did the change take place, and in what parts of the building do we first trace it? To this it may be replied, that the vaulting, as a general rule, may be considered the part in which it first manifested itself.

Up to the middle of the twelfth century timber roofs prevailed in England. At Canterbury we know that the aisles were vaulted, while over the central part a timber roof was used, "excellently painted," as Gervase assures us. But in the south of France, in Provence, and also in Burgundy, vaulted architecture had long been in fashion. The problem seems to have been to combine the advantages of lightness and elegance of form which the timber roof of the north possessed with the greater appearance of substance which the more costly material would naturally afford. Without, then, entering into all the structural details of this question of vaulting, we may ask ourselves what were the great objections to a church in the basilican form, which was then prevalent, in which the semicircular arch was strictly adhered to? Barrel vaults would be those in general use.

1st. There would be a want of light from the clerestory windows. The defect would be generally appreciated, because this mode of lighting, as has been shown, prevailed from very early times: but it would be more than ever felt in the north of Europe, on account of the dark climate and the invention, at that time recent, of painted glass, which is known to have exercised great influence, even on the structural part of churches.

2nd. The enormous weight of barrel vaults, when built over large openings, and their lateral thrust, would cause the question of abutments to be one requiring the most serious consideration of the architect.

3rd. The different forms of the vaults would cause endless perplexity. A semicircular arch is obviously only fitted for a square space of invariable form. The difficulties, therefore, of throwing an arch over a rectangle of variable magnitude were constantly on the increase.

What was wanted was more light, more strength, more height. These three objections were remedied by the pointed arch.

1st. The darkness of the clerestory, by the lighter form of roof, and larger windows.

2nd. The difficulties of abutment, by groined vaults and flying buttresses.

3rd. The structural difficulties connected with the vaulting itself, by using a variable arch to cover a variable space as well as a variable height. Considerably more importance has been attached to the last difficulty by some very able architects than to the two first, and as the vaulting at Canterbury is what is called hexapartite, a word in explanation is permissible.

The hexaparite severy, or ciborium, covers two oblongs. The compartments in the side aisles being square, were vaulted in the usual way by a double cylinder. The question then arose: how to cover the corresponding oblong space in the central aisle? The difficulty was thus met. A square was made out of the two oblongs, but two bays in the side aisles formed only one side of that square. Thus the intermediate pier was brought in, partly as a support, but more perhaps as one of the vaulting ribs, and the difficulty was never met (as Mr. Fergusson says) *satisfactorily*, till the pointed arch came to the rescue. His words are: "This insertion was neither quite a rib nor quite a compartment of a vault, but something between the two, and in spite of all the ingenuity bestowed upon it in England, France, and Germany, in the eleventh and the beginning of the thirteenth centuries, the effect was never quite satisfactory."

The great elevation of the small intervening arches has led some to suppose that in them the pointed arch first appeared: such, however, is not always the case, as in Canterbury, it will be observed from the diagram, they are round, while on the other hand, the large arch spanning the whole central aisle from pier to pier is pointed.

It would be presumptuous in any one in the present day to offer any new theory as to the pointed arch, to the adoption and use of which, as I believe, many causes concurrently gave rise: and yet, in estimating these, perhaps the consideration of what is called the pitch of the roofs has hardly obtained sufficient importance. Pagan architecture in India, in Assyria, in Egypt, in Greece, was essentially, at least in its main features, trabeated—it was the architecture of the lintel; but the transition from the lintel to the gable is easy, and already in Greek architecture we have the pediment,—a form which has been found, curiously enough, by Colonel Vise in the central chambers of the Egyptian pyramids. Again, from the pediment to a rude form of arch the steps are not difficult: the horizontal beam which had been cut in twain to form the gable, cut into three, or five, or seven pieces, gives rise to an arch of which each piece is a voussoir. Thus we arrive at two methods (besides the lintel) of covering a *space*—the gable and the arch. Now, the pointed arch is a combination of these two methods, and has been well described by a modern writer as an arched or curved gable. Admitting this description to be true, it seems to follow that when we find a vaulted roof in which semicircular arches are used covered with a gable, whether of wood or stone, it is probable that the structural advantages of the pointed arch would be brought to light. Mr. Fergusson, in his excellent "Handbook," cites several churches in the south of France, where, according to M. Felix de Verneilh, a considerable authority, pointed arches were used very early in the eleventh century. No timber roofs were made use of, but the vaults were filled in with rubble: the object of the architect was clear—to avoid loading the arch at its crown to an unreasonable or dangerous extent. The same argument will apply with equal or greater force, where a timber roof is used as a protection. Now, in Italy and Germany, and also in the south of France, the timber roof over a vaulted ceiling gave rise to a very interesting kind of ornamentation—the open arcade. Structurally, perhaps, little can be said of it; but in the eastern ends of churches generally, and especially in their apses, this species of gallery has met with deserved applause. It will easily be recognized, and its adaptation to a southern climate admitted, where little snow falls, and where this kind of double roof would add much to the coolness of the interior. It is not, however, well suited to a northern climate. In Germany we have it travelling up the Rhine as far as Cologne, though generally closed in the north. In France it is confined to the southern provinces. It does not enter into the north of Europe; it shrinks, as it were, from that region which is called the fatherland of the pointed arch. When, therefore, the Northern church builders undertook to alter the Romane or Romanesque style, and suit it to their own taste, this peculiarity would suggest itself as one naturally requiring modification. They found a low, flat roof over a semicircular vault with an intervening gallery. The objections to this form, and the low dark clerestory it involved, have been already stated. To close the gallery and to raise the roof would be the natural course of proceeding, and would, as I contend, very naturally suggest the conversion of the round Southern arch to the Northern pointed.

It would be interesting and possible to show how, in travelling northward out of Italy, every part of the building underwent the same sort of change; to trace the double route, as it were, of the Lombardic architecture into the south of France, on the one hand, and into the centre of Germany on the other; but time does not permit, and will only allow me, in conclusion, to make a few remarks upon our English transition, and the English element, as I have ventured to call it, at Canterbury.

English Element.—It is not possible to do so without observing that our Romanesque style is properly called "Norman;" and however justly that nomenclature may be objected to on the Continent, it does not invalidate the claim of that wonderful tribe of Northmen to have founded the English branch of the Romanesque family.

It may, perhaps, be allowed to call our early Norman, "Romanesque, with a strong Gothic tinge," the boldness of the mouldings, and the general sternness of type, indicating a rude energy in the builders. In the choir of Canterbury, as left by William of Sens, we have advanced Norman, with a French, and even a classical tinge upon it, noting our distant connection with Rome and the South, as clearly as the Latin words in our language, or the Latin prayers in our Liturgy.

William the Englishman carried the transition a step farther. In his clerestory, and in other parts of the work, we find the round arches almost superseded. In Becket's crown, the whole of which came from his hand, there is not a single round arch. Of course some difficulty must exist in determining how far his work was his own, and how far he was engaged in carrying out the plans of his predecessor; but the evidence strikes me as in favour of an original mind. He is represented as having been overseer of the masons under William of Sens, and described by old Gervase, "though small in body, yet, in workmanship, acute and honest." I cannot avoid noticing a round base to a clustered shaft, which there is much reason to suppose may have been from a design of English William's, and the two slender shafts in the centre of the crypt, with round abaci, undoubtedly of Early English type. There is nothing at all like them in the work of the Frenchman. To my mind it indicates the birth of that chaste and beautiful phase of the Pointed style, which reached its acme in the lovely spire and perfect proportions of Salisbury.

I shall now only mention one or two more contemporary buildings, of which I exhibit drawings. The choir of Ripon was built by Roger of York, as has been proved by recent research, between 1154 and 1181. The similarity of the clerestory windows to those at Canterbury will be noticed.

Another drawing, for which I am indebted to my friend Mr. G. G. Scott, is that of St. Cross, near Winchester. It was founded by Henry de Blois, brother to King Stephen, who held the church from 1136 to 1171. The mouldings round the windows, which have a peculiar Norman type, are very original.

It is natural to suppose that, in these buildings, English artisans were employed, while at Canterbury, which was the metropolitan cathedral, where no expense was spared, French artists should have had the preference. Looking at the various buildings of this era, in England, it is not a partial verdict to assert, that while they seem to show a knowledge of French development, there is no slavish imitation. On the contrary, there is a freshness of conception, and an originality of design, which is quite captivating. In the Museum here may be seen a doorway from the little interesting church at Barfreston, which will go far to illustrate my meaning.

To sum up the whole. At the beginning of our transition we had a stronger Romanesque character than the French. It had been given us by our Norman conquerors. The keep at Rochester and the nave at Durham exceed, perhaps, in rude sternness, anything we find abroad; but the remarkable converse of this is, that at the close of our transition we had not only thrown off this excess of Romanesque characteristics, but had gone beyond the French in altering those of a less palpable kind. The single column had, in all cases where it was used for a support, become the clustered shaft; the square abacus had given way to the round. Our arch mouldings had become richer and more studied in their profile, composed of distinct and beautiful members. The vertical line in every part of the building had become more pronounced; so that at the end of the period, we had departed much more widely from our Norman type than the French from their Romanesque.

The value of Canterbury as a transitional example, is that its history is well known, that there is a date for everything, and that we can trace in the work of William of Sens, not what the French would represent as the introduction of the Pointed style, but simply an interpolation of French art, which had its influence, doubtless, on the architecture of the day.

To conclude: If there be, as there perhaps is at Canterbury, a peculiarly foreign *type*, and if there be French work in the choir, it is also, in many respects, a peculiarly English cathedral: as such it addresses itself very specially to our hearts. It cannot come near the French cathedrals in altitude. Amiens, for example, is, in round figures, double its height. Beauvais, which is a wonderful *tour de force* rather than a work of real art, is even higher than Amiens. But what it loses in this respect of sublimity may perhaps be more than compensated for by the juster proportion of the parts, by its interesting and varied outline, by the pleasing variety of light and shadow, which plays over its double transepts and numerous projections. It is one of the longest of those very long churches—our English cathedrals. It is within 10 or 20 feet the same length as Ely, Winchester, or Westminster, and nearly 100 feet longer than the principal cathedrals of France, Notre Dame de Paris, Chartres, Amiens, and Rheims. The average is, for the English about 520 feet, and for the French, 420 feet. It is characteristic of England, too, because, whether seen from a distance or close, the masses of its architecture are usually broken by luxuriant foliage. It rises, not like a continental cathedral in the midst of houses, shops, and hovels built up against its sides, but as all buildings look best—almost like a flower from a carpet of green.

It is on the outskirts of the town rather than in its centre, which is also a marked feature of our English cathedrals. The monastic buildings round it are not levelled with the ground, but remain covered with ivy, and here and there a wild rose, full of ruinous beauty. Among them we may remark the Norman staircase, probably of the time of Anselm, which is thought to be a unique specimen, and a building supported upon beautiful Norman pillars, once intended for a tank, which contrary to, even reversing the usual practice, has been converted from a profane to a sacred use, and now forms the baptistery of the cathedral. We may be thankful that these precious relics are no longer desecrated by the hand of Puritanical violence, or left to perish through ignorance or neglect, but tended with all the care of true wisdom which is ever anxious to preserve, and to adapt to present use these noble memorials.

Happy are those who can cherish the traditions and the arts of our ancestors, without sacrificing the many advantages and blessings of modern civilization, who combine with the greatest fitness for a life of business, and the most perfect appreciation of the blessings of liberty in action as in thought, not merely a taste for the refined pursuits of the antiquary, and a love of the picturesque, but a genuine spirit of reverence for whatever may be found of the true, honest, and beautiful in the religion of past times.

SPECIAL MEETING OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE PRESIDENT.

A SPECIAL meeting of the Institute was held at the house in Conduit-street, on Monday evening last, to elect a president in the place of the late Right Honourable Earl de Grey, and to consider a communication received from the Royal Academy in reply to a letter addressed to that body from the Institute.

Mr. George Godwin, vice-president, presided. The meeting was very numerously attended, and included Mr. Cockerell, R.A.; Professor Donaldson, Messrs. Tite, M.P.; Pennethorne, S. Smirke, R.A.; Scott, A.R.A.; H. Ashton, V.P.; Ashpitel, Allason, Baker, C. Barry, J. Billing, Bury, J. Clarke, Ferrey, James Fergusson, Garling, Hakewill, Haywood, I'Anson, Jennings, Kerr, Knowles, T. H. Lewis, Mair, Mocatta, Mylne, C. C. Nelson, Norton, J. Papworth, Porter, Roumieu, Scoles, Teulon, Vulliamy, Whichcord, T. H. Wyatt, Digby Wyatt, Edmeston, Hansard, F. R. Wilson, Rickman, and many others.

The chairman having stated the circumstances under which the meeting was held, and read the notice convening it, stated that the Council after deliberating on the subject, and with the view of assisting the meeting in coming to a satisfactory decision of the question, had requested the honorary secretaries to inquire of C. R. Cockerell, esq., whether in the event of his election as president, he was willing to undertake the office; and in the event of the reply being in the negative, to make the same inquiry of Sir Charles Barry. The honorary secretaries had done this, and it was his duty to state that both gentlemen, with strong expressions as to the honour intended to them, had felt it necessary to decline, and had given their reasons for doing so. The matter was in the hands of the meeting, and it was for them to decide on the course to be taken.

Mr. Tite addressed the meeting at considerable length, expressing his gratification at finding that the council were disposed in favour of a professional president, and giving his reasons why, on previous occasions, as then, he had advocated this view. He showed how, shouldered and elbowed on all sides, architects had suffered through the president of the Institute not having had architectural knowledge, especially in respect of the Great Exhibition of 1851; and pointed to the Brompton boilers as one actual result of injury to the public. He had no hesitation in saying that Mr. Cockerell was the most learned and accomplished architect in Europe, and he again urged him to accept the position. Failing in that, he moved a resolution to the effect that the selection of a president on the present occasion should be made from the list of Fellows.

Mr. Jennings having seconded this,

Mr. Cockerell, who was loudly cheered, said he viewed the offer made to him as the crowning honour of his life, and yet felt compelled to decline it; firstly, on the ground of his years, which would prevent him from discharging effectively its duties; and, secondly, because he thought it was desirable the president of the Institute should be a nobleman, removed from the possibility of professional jealousy. It was to the House of Lords we must look for a perfect gentleman, and one capable of throwing the oil of gladness on troubled waters.

Mr. C. Barry supported very effectively the proposition that the president should be elected from the professional body.

Mr. G. G. Scott said Mr. Cockerell's was certainly the most illogical speech he had ever listened to. Mr. Cockerell had disproved all his own positions. He had shown by his speech that he *could* discharge the duties of his office, and he had certainly sketched his own portrait in the individual he had described as dispensing the "oil of gladness." Moreover, if Mr. Cockerell had attained the eminence he possessed in any other profession—the law or arms—he would himself be a peer.

Mr. Pennethorne supported the proposition for an architectural president.

Professor Donaldson differed from that view, and urged that the interests of the Institute would be best served by one who was free from professional predilections, and had access to the throne: he instanced, too, the advantage of such social meetings as Earl de Grey was in the habit of convening, and moved an amendment to the effect that the Council should be requested to invite some nobleman or other member of the aristocracy to become the president.

Mr. Mocatta seconded the amendment.

Mr. S. Smirke supported it, urging it was desirable to keep to the old course, which had led to most satisfactory results.

Mr. T. H. Wyatt, Mr. Digby Wyatt, and Mr. Ashpitel also spoke.

Ultimately, amidst the applause of the meeting, Mr. Cockerell consented to wave his objections; and,

The Chairman having put it to the meeting (on the motion of Mr. Tite, seconded by Professor Donaldson), declared him duly elected President of the Royal Institute of British Architects.

In consequence of the lateness of the hour at which the decision was arrived at, Professor Donaldson said he would postpone a motion he had to propose, touching the reply fromthe Royal Academy, till the General Meeting of the Institute, in May.

We must mention that the discussion was carried on with remarkable skill and kindliness.

THE PRESIDENT'S ADDRESS AT THE INSTITUTION OF CIVIL ENGINEERS.

ON January 10th, the whole of the evening was occupied by the reception of an address from the president, Mr. G. P. Bidder, on taking the chair for the first time since his election. This address has been printed and circulated. Towards the close of it he said:—

As a natural sequence to the preceding subjects, we are led to the consideration of the proceedings which have taken place, with regard to what are termed our Harbours of Refuge,—as it must be obvious that one main object of these works has reference to the operations of our naval forces—and I believe I am justified in observing, from what transpired during a recent discussion at this Institution, that neither mechanically nor financially can they be considered to be in a satisfactory position. According to the present system of conducting such works, it is obvious that the principle of construction employed at Dover and at Alderney must necessarily restrict their adoption to a very limited extent. Whether we look to the time, or to the cost, the results are altogether inadequate to the sacrifices required. The protracted time is, to a great extent, owing to the system of voting the funds annually by driblets,—the result of which is, that neither the Government nor Parliament fairly appreciate, at the commencement of a work, the full extent of the responsibility involved, either as to time or cost. Can it be supposed that Government, or Parliament, when adopting the recommendation of the commission to construct a harbour of refuge at Dover, imagined that the works would involve an actual cash outlay of five or six millions, without interest, or of thirty or forty millions, including interest, and that a hundred years, at least, would elapse before the full efficiency of the works would be secured; or that, after an expenditure of nearly half a million sterling, and the lapse of upwards of ten years, the constructive resources of Great Britain would be exhibited to the foreigner landing at Dover in the shape of an incomplete jetty, with two incommodious landing-places? These and other results of a similar character may be fairly attributed to the system adopted, and must not be laid to the charge of any individual or department, and certainly not to the eminent statesmen who guide the helm of the nation for the time being; for in matters of this description they possess no interest, political or otherwise, apart from that of the country at large. No doubt one of the inconveniences of the present system is that of having to apply to Parliament annually for grants,—the amounts of which, and the chance of obtaining them, depend upon the financial state of the country and the temper of the House of Commons, even although the period of the session may be selected when the Government has the best command of the attendance in the House. No doubt that, having regard to these circumstances, the original plans of the works have often been conceived on a limited and narrow basis, adapted to the proposed expenditure, but totally inadequate to the objects supposed to be attained; the ultimate result generally being an extension of the design, an enlargement of the estimates, and a final completion of the works in a form or shape which defies investigation to affiliate. Thus money is wasted, time is sacrificed, and full efficiency is not attained.

The remedy for this defective state would appear to be, that, antecedent to any application to Parliament, the Government should prepare full and detailed plans of the entire extent of the works intended to be executed, and obtain tenders from competent contractors for the execution, stating the time of completion and the terms and mode of payment. These plans should be deposited, at fixed periods, at the Private Bill Office, for the inspection of all who are interested. Thus, before the vote was taken, there would be ample time for full criticism on all points, and, though additional labour might be thrown upon the public departments in preparing the documents subjected to such investigation, the House of Commons and the members of the State would have the means of coming to the debate fully informed on all points connected with these national works.

In a financial point of view the gain would be considerable, because a work which is executed within a reasonable time is always more economical than one which is extended over an indefinite period; and also for direct financial considerations; which may thus be exemplified. Suppose a work estimated to cost a million is estimated to extend over twenty years, the outlay being restricted by the annual grant to 50,000*l.* a year. The ultimate cost of this work to the country, supposing the Government to raise the money at 3 per cent., involves an additional annual charge of about 42,000*l.* per annum, whereas, if the work was executed in five years, by annual grants of 200,000*l.* a year, the annual charge to the country would only be 33,000*l.* a year—thus, irrespective of all other advantages, saving 9,000*l.* a year. These observations only apply to works of real utility, and do not apply to undertakings of so useless a character that their execution cannot be too long protracted,—such, for instance, as the pier at St. Catherine's, in Jersey, and others of a similar character.

I cannot but feel assured that, were the principle adopted which I have enunciated, the defects now admitted to exist in the harbours of Holyhead and of Alderney would have been avoided, and the Blue Book mystification at Portland, respecting the expenditure upon the convicts employed upon the breakwater works, would not have occurred, and the nation and Parliament would have had the satisfaction of realizing, on all these works, the full value of the outlay incurred. Ministers, by taking at once from Parliament a grant for the full amount of the expenditure, would avoid the annoyance of the annual appeal and the recurring waste of the public time, in re-discussing all the features of these undertakings.

I have alluded here to certain defects which will always be inherent in the harbours of Holyhead and Alderney; both of which were, doubtless, originally projected on so limited a scale, on account of the difficulty of obtaining parliamentary grants; but, during the progress of the works, their total inadequacy for the objects proposed became so obvious, that it would have been absolutely criminal to have persisted in the original designs: their extension, therefore, became a matter of necessity; but, alas! these extensions could only be carried out in such directions, that it is now admitted, that, for the same amount of money, the same extent of breakwater might have been constructed, in a form much better calculated to resist the action of the seas, whilst affording more security and nearly twice the amount of accommodation.

Before concluding my address, I cannot avoid contrasting the progress of Government works with those undertaken by private enterprise. There is, within a short distance, an iron bridge, scarcely even partly completed, across the River Thames. There is no doubt that this bridge will be substantially and skilfully constructed; but it cannot be said to involve any feature of mechanical difficulty: it is constructed in London, and thus commands, in respect of labour and materials, the resources of the whole empire. Another iron bridge, spanning the River St. Lawrence in Canada, is entirely completed, and is opened for traffic: this bridge extends nearly a mile and a half across the stream, having a current varying from seven to ten miles an hour: it has to resist the pressure of ice accumulating occasionally to the depth of 30 or 40 feet: the severity of the climate is such as to restrict the actual period of working to a few months in each year: the iron work and the great proportion of the skilled labour were derived from England; and a severe monetary crisis had also to be surmounted, which latter, however comparatively unimportant in Government operations, exercises a formidable influence on private enterprise. Yet this entire work has been executed contemporaneously with the one uncompleted half of Westminster Bridge;—thus evidencing what the civil engineer can do, when impelled by pressure of private enterprise, as contrasted with his exertions when trammelled by the restrictions incidental to the conduct of Government works.

Gentlemen, I am well aware that the observations I have made are open to the severest criticism. I have advisedly introduced into my address subjects and opinions of the most controversial character, because it is my design to induce upon them the fullest and freest discussion. I have endeavoured, on the one hand, and I hope with success, to avoid subjects of trivial interest; whilst, on the other, I have attempted to direct my remarks to subjects of national, commercial, and professional importance.

I have now been a member of this Institution for thirty-five years: during that period I have been a careful and anxious observer of its progress, and the result of my observations leads me to believe, that nothing has tended so much to the steady growth of this society as the animated discussions which so frequently occur within these walls. This point may, however, be also a subject of controversy; but, gentlemen, I have only one further remark to make,—upon which I can defy controversy,—that is, that all I have said within these walls, and that my conduct, while occupying this chair, has been and will be inspired by the determination, so far as my humble powers permit, to perpetuate the prosperity of this Institution, and to maintain the reputation of this noble profession of which I am proud to be a member.

The discussion upon Mr. Grantham's paper, "On Arterial Drainage and Outfalls," was resumed at the next meeting, Tuesday, January 17.

MODERN ARCHITECTURE OF GERMANY.

THE address delivered by Mr. Tite, M.P., at the opening meeting of the Royal Institute of British Architects, in the new rooms at Conduit-street, fully reported in our pages at the time, has been privately printed in an octavo form, and obligingly presented to each member of the Institute by Mr. Tite.

In an appendix we find the following, under the head "Modern Architecture of Germany:"—

"On this subject I applied to my esteemed friend the Hof-Rath Stüler, of Berlin, one of the architects to the King of Prussia, and an honorary corresponding member of the Royal Institute of British Architects. His memoranda arrived too late for me to introduce the matter into my address; but I gladly take the present opportunity of preserving his valuable and interesting *résumé* as follows:—

New Churches and Restorations. — During the last twenty years about 300 new churches have been erected, among which the chapel of the Royal Palace at Berlin is deserving of especial mention.

Among restored buildings the cathedrals at Cologne, Erfurt, Cammin, and Halberstadt, are deserving of notice; but in all the provinces of the State the restoring of ecclesiastical buildings has been much attended to.

The plans for these churches and restorations have for the most part been made by Stoller and Stüler; but numerous restorations have also been made by Guast and Zwirner.

Edifices for the Purposes of Instruction and the Study of Art:—

Stüler.—The new museum, Berlin; the university at Königsberg; buildings for clinical purposes at Königsberg, Halle, and Greifswald.

Gymnasia (high schools) at Magdeburg, Lyck, Tremezno, Bromberg, Inowrazlaw, Posen. '*Realschulen*' at Inowrazlaw, Berlin, Bromberg; institute for teachers at schools and sundry boarding-schools at Steinau, Munsterberg, Osterburg, Eylau, Peiskretschaw, Neuwied, Oranienberg. Most of the plans of these edifices are by Zucke.

Stüler.—Institutes for the education of clergymen at Wittenberg and Berlin; smaller buildings for schools in great numbers.

Busse.—Buildings for purposes connected with the administration of the law; the large edifices for the administration of justice and for imprisonment, at Breslau, Moabit near Berlin, Cologne, Münster, Ratibor, Minden, Eberfield, Steinau, &c. Smaller buildings of this kind in great numbers. A very considerable number of buildings for the Post-office service, rendered necessary by the increase of communication, and by new railway works.

Fleischinger and Drewitz.—Numerous barracks and military buildings.

Hasse, Heiro, Statz, Ark, Steudener, Romer.—Sanitary Buildings.—Great hospitals in most of the large towns. Lunatic asylums at Berlin, Hall, Schmetz, Ominsk. Commercial Buildings.—Banks in various places; the New Exchange, Berlin.

This activity in architectural matters, on the part of the State, is, if possible, exceeded by private undertakings, the population having increased in so enormous a degree, that Berlin within the last twenty-five years has doubled her population. The great railway undertakings here have given rise to the most magnificent buildings as termini, and to the activity of engineers; among whom the most prominent are Mellin, Neuhaus, Wiebe, Hentz, Höhner, Stein, Hartwich, Rosenbaum, and others.

All the private architects of Prussia, among whom the most important are MM. Knoblauch and Hetsig, are overwhelmed with commissions: so that the latter for instance has designed and built twenty-seven country-houses and schlosses; and forty-three private town-houses, besides many public buildings. This number is probably exceeded by those built by Knoblauch. In addition to these, the royal architects Stüler, Strack, Schadow, Hesse, Zwirner, Von Arnim, Gottgetreu, and others, have been engaged in making numerous plans and designs for private edifices; and have constructed a very considerable number of country and town-houses, besides other buildings.

In reference to the styles in which these buildings have been executed, it must be remarked that they assume an eclectic tendency in Prussia as nearly everywhere else. In the northern districts, the influence of the Berlin school, through the works of Schinkel, renders the tendency to the Greek Antique common; although it is not employed so exclusively and in such purity as it was by Schinkel. In the western provinces, however, and especially in South Germany, a preference for Mediæval architecture, and particularly for Gothic, is to be discovered; and is by many employed to the exclusion of other styles. In Prussia, those who have employed themselves more specially in this direction are MM. Zwirner, Kashdorff, and Statz of Cologne. Among the most important architects of Northern Germany the following are perhaps the most distinguished:—

Vienna.—Förster, Vander Müll, Von Licandsberg, Hansen, Ferstel, Döderer, Kreuter, Schmidt, &c., having a special tendency to the Mediæval style and Renaissance school: first employed with great skill by Martin, for the requirements of the present day.

Munich.—Von Klenze, Ziebland, Lange, and Veit Bürklein, whose works are well known.

Carlsruhe.—Hübsch—see his 'Early Christian Architecture,' and his buildings: Eisenlohr, deceased; see also his publications on architecture.

Hanover.—Lubes, Haase, Vogel, Hunnaeus, and others."

Memorial Church of St. James at Gerrard's Cross.—On this subject Mr. Tite says:—

"In this appendix I may perhaps properly be allowed to add a word for myself on this building, which has been so rigidly scrutinised, though it did not appear to me to be of sufficient importance to be included in the preceding address. It has been exposed to many remarks and objections, because it is not Gothic. The reasons why it is not are best summed up in the fact that it was a monumental church in the first place, and that, from our earliest associations in architectural history, the character of a tomb is best obtained by a dome being built over it. That opinion is shared by the *Quarterly* reviewer in the following passage:—'It is remarkable that the dome was first employed in Persia and in India, as in Egypt, for tombs—thus offering a very curious analogy with the sepulchral architecture of the Etruscans, Romans, and early Christians, and suggesting the inference hinted at by Mr. Fergusson, that its use for such purposes was traditional, first among cognate races, and afterwards throughout the whole world.' This led me naturally to the style of architecture which I adopted; and it had also some personal reference to circumstances connected with the history of my gallant deceased friend, but with which the world has nothing to do. I have neither desire nor intention of suggesting that the style I adopted should be imitated or followed. I pleased those for whom I laboured; and, if I may be allowed to say so much, I pleased myself. It has been said it is very costly. I do not think so; but I was not directed to regard the cost. I believe that the total expense of the building has been about 7,000*l.*, which surely becomes a trifle when compared with the lavish though becoming expenditure of the votive-churches of the Arkwrights or the Cubitts; or the still more costly folly of the church in Margaret-street.

If this small example, however, should lead, by the importance which appears to have been given to it, to the propriety at least of considering whether in these days other styles of architecture are worthy of adoption or imitation, I think that I shall 'have done the State some service.'"

OPENING NEW WESTMINSTER-BRIDGE.—The demolition of Denton's, (late Oliver's) Hotel, the Westminster Hall Hotel, and several of the adjoining houses in Bridge-street, Westminster, has commenced, to form the southern approach to the new bridge at Westminster, which is to be opened for carriage traffic on Wednesday, the 1st of February, foot passengers continuing to pass over the old bridge for a time.

A THEME FOR THOUGHTFUL ENGLISH WORKMEN:

OR, OCTAL *versus* DECIMAL.*

OUR fathers, in the ancient times,
('Tis thus the story goes,)
Did have ten fingers on their hands,
And on their feet ten toes.

And their fingers oft assisted them
With numbers upward mounting,
And thus the number ten became
The basis of their counting.

They might have counted otherwise
(So teaches the "Professor"†),
If they had had or twelve, or eight,
Or other number lesser.

This remnant of the golden age
Among us moderns lingers,
The basis of our counting is
The number of our fingers.

But whether we should use it still,
Or whether this the season
To change our mode of numbering,
Please listen to my reason.

As an integer take the eight,
Let eight and ten change places,
You'll have for measure, value, weight,
A natural, perfect basis.

But should you doubt what I aver,
And think of disputation,
I will, with your permission, sir,
Give you a demonstration.

Thus:—Take at first a little cube,
Then add a second to it;
Saying, "One and one are two"
(A little child may do it).

Add a third, and then a fourth,
Just behind the other;
Saying, "Two and two are four;"
And thus teach one another.

Place four others on the top
With care, if not with quickness:
You'll find the eight are twice the first
In length, and breadth, and thickness.

(And as a child can add them up,
When once or twice he's tried them,
So will he learn as easily
To equally divide them.)

That "Eight of these make one of those,"
Is truth (none can deny it);
I think, that in arithmetic
We should be guided by it.

'Tis but a step—but 'tis a step
(No other step shall differ)
That leads the mind progressive up,
Upward and onward ever.

And as it rises, so it spreads,
Becoming ever greater;
Embracing all the works of God,
Our good and wise Creator.

T. G. ATKINS.

PRIZE DESIGN FOR THE WASHINGTON MONUMENT, PHILADELPHIA.

THE first premium, of 300 dollars, for a design for a monument offered by the Washington Monument Association of the First School District of Pennsylvania, says the *Ledger*, has been awarded to Mr. George S. Bethel, architect. According to the design of Mr. Bethel, the monument is to be 225 feet high, including a colossal figure of Washington, of about 20 feet. The following strange description is given of it:—Around the base of the shaft will be an octagon-shaped Gothic structure, 80 feet in diameter and 50 feet high, highly ornamented, and to be surmounted on each corner of the octagon by figures representing the patriots of the Revolution. The space between the base of the shaft and the walls of the building is designed as a promenade. Above this structure the shaft has a base of the same shape, in each face of which is a large window, and on the corners figures are to be placed as on the building described. From this base the octagon-shaped shaft rises 72 feet. It is pierced with windows on four sides, and ornamented on the other faces with appropriate devices. The cap or top of the monument is to be composed of large brackets supporting a cornice with enrichments, and forming a balcony, within which will stand the pedestal to support the figure of Washington. The balcony, from which a magnificent view of the city and surrounding country may be obtained, will be reached by a spiral staircase. It is proposed to build the structure of white Pennsylvanian marble, and to use the blue marble for the ornaments.

* We are not to be understood as adopting the opinion set forth.—ED.

† Hennessey.

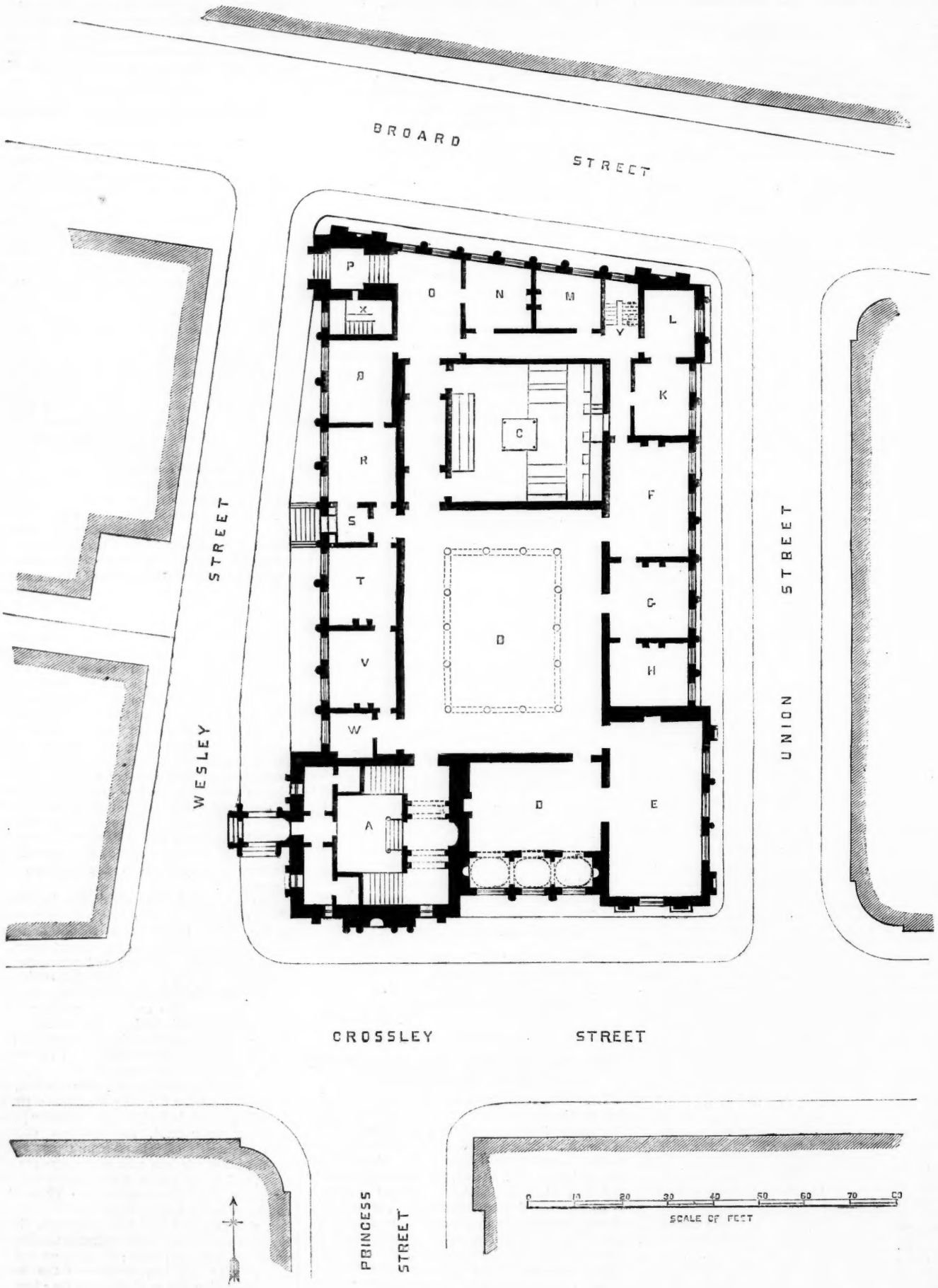
PROPOSED TOWN-HALL, HALIFAX, YORKSHIRE.

THE intended Town-hall at Halifax will be placed in the heart of the town, upon property obtained from Mr. Alderman John Crossley, who, when Mayor of Halifax, in the years 1850 and '51, conceived the noble project of removing a considerable portion of the old town, consisting of unsightly and objectionable buildings, and rebuilding that portion of it upon a costly and magnificent scale. With this view he purchased the property in question, and proceeded with the work of demolition and reconstruction, involving, it is understood, an ultimate outlay, on his part, of above 100,000*l.* New and spacious streets have in consequence been since formed on the site of the houses removed, and several public and private buildings adjoining them have already been erected, including a great hotel, a bank, a mechanics' institute, and several costly shops and warehouses. In the midst of these and other proposed edifices of a similar character, is the site for the intended Town-hall, which will be isolated and surrounded by spacious streets and form a conspicuous object at the end of one of the principal new streets, named Princess-street.

After various steps had been taken with reference to drawings for the building, the matter was placed in the hands of Sir Charles Barry, whose design we illustrate in our present number, with a perspective view and a plan of the ground-floor and surrounding streets. The peculiarities of the site, as regards its extent and form, and its position with respect to Princess-street, the great variations in its levels, and the loftiness of the present and proposed buildings, in its immediate vicinity, have suggested the principles of the design. Verticality, it will be obvious, has been striven for. The height of the building, and of the lofty tower and spire, at the south-west angle of it, facing Princess-street, are intended to have the effect of giving importance to the moderate size of the building, whose dimensions will bear no comparison with those of the large and costly edifices recently erected as town-halls in several of the great provincial towns in the North of England; for, unlike those buildings which are generally devoted to festive as well as municipal objects, the new town-hall at Halifax will be exclusively appropriated to the business of the corporation.

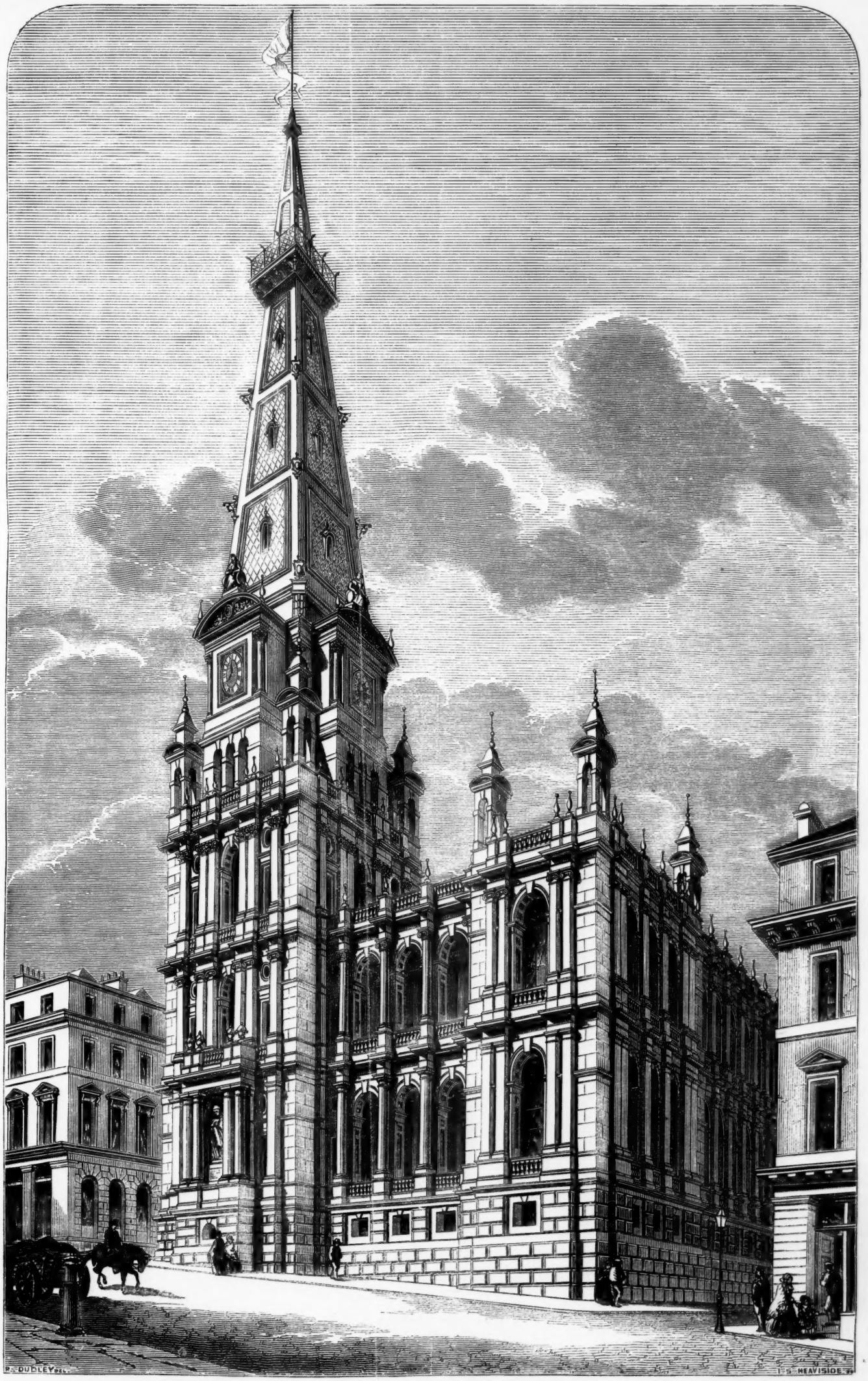
The accommodation which the building will afford consists of a large hall, a borough court of justice, with magistrate's room and other appendages, a news-room, a concert-room, three committee-rooms, borough and poor-rate offices, and offices for the town clerk and engineer, the accountant and the market inspector, a mayor's parlour, telegraph-office and waiting-rooms, and residences for a superintendent of police and a housekeeper. All this accommodation is provided in the principal floors of the building. In the basement story, which, on the east side of the building, is almost wholly above the level of the ground, will be the accommodation for the police force of the town, including a parade hall, &c., and cells for prisoners awaiting their trial, also spacious workrooms with engineer's offices and store-rooms attached, required for the gas and water services of the town, which are under the exclusive control and management of the corporation. There are five entrances to the several departments of the building, the principal one being through the great tower, which contains the staircase leading to the upper or principal floor; a chamber communicating with the terrace flats of the building; accommodation for a clock with four large dials, capable of illumination by night; and a peal of bells. The entire building, with the exception of the lantern-lights over the great hall and borough court, will be covered with a terrace-flat, which, together with the gallery at the summit of the spire, will command extensive views of the town and its suburbs, and afford facilities for occasional public demonstrations by means of flags, illuminations, &c. Tenders have been received for executing the whole of the works for the sum of 23,575*l.*, and the works will be commenced shortly, when the season of the year is more favourable than it is at present for the purpose.

PROPOSED TOWNHALL, HALIFAX.——*Plan of Ground-floor of Building and the surrounding Streets.*



References.

A. Tower Entrance and Stairs to Council and Committee Rooms.
B. The Hall.
C. The Borough Court.
D. Committee-room.
E. News-room.
F. Magistrates' Room.
G. Waiting-room.
H. Telegraph Office.
K. Cloak-room.
L. Magistrates' Clerk.
M. Police Superintendent.
N. Market Inspector.
O. The Court Vestibule.
P. The Court Entrance.
Q. Overseers.
R. Poor-rate Office.
S. Rate-payers' Entrance.
T. Borough-rate Office.
V. Accountant's Clerks.
W. Accountant.
X. Housekeeper's Stairs.
Y. Police Stairs.



PROPOSED TOWNHALL, HALIFAX, YORKSHIRE——SIR CHARLES BARRY, R.A., ARCHITECT.

CHELSEA ATHENÆUM CONVERSAZIONE.

THE Chelsea "Athenæum" is a society having for its object, the cultivation of literature and science, especially in the younger members of the community; and a paper is read on some interesting subject *by one of the members*, every week. Nearly all the members are men who are studying for the various professions. The Athenæum is founded on nearly the same principles as the learned societies of London, and thus differs materially from the "Mechanics' Literary and Scientific Institutions." The subjects are, of course, treated of in a comparatively elementary way. Two or three of the lectures have been printed, and are creditable to the authors of them.

The Athenæum has now successfully carried on its operations for a year, and it was thought desirable to commemorate the event by a *conversazione*. This was held last week at the Museum of the Department of Art, at Brompton, by the permission of the authorities. The parts of the Museum occupied, were the rooms containing the Art-Treasures, the Sheepshanks, the Vernon, and the Turner picture galleries; the central hall, and the lecture theatre. At nine, addresses were delivered in the lecture theatre, Mr. Robert Hunt, F.R.S., presiding, by Messrs. Macdonald & Lyon, members of the society. The Rev. J. B. Owen then delivered a suitable concluding address, "On the Usefulness of such Institutions." Votes of thanks were next moved by Mr. Child to Mr. H. Cole, for the facilities he had afforded the committee; and to Mr. P. C. Owen, the deputy superintendent-general, for the way in which the arrangements had been carried out. Mr. Farren (the treasurer) moved a vote of thanks to Professor Hunt, for his conduct in the chair, and the company then dispersed over the various parts of the building. It was altogether a successful gathering.

ST. LUKE'S HOSPITAL FOR THE INSANE.

THE daily papers a few days ago gave an account of the annual Christmas ball of the patients in St. Luke's. It may be useful to make the position and purpose of this institution better known than they are, and to obtain such improvements in the building as may be possible.

Old-street, and the surrounding neighbourhood of St. Luke's, was in a different condition from what it is now, seventy or eighty years ago when the hospital was raised: then green fields could be seen in all directions; and its projectors, in days when sanitary science was less understood than at present, thought that they had met with a salubrious position. Even in the first instance, however, it could not have been a desirable spot, for the place was little better than a swamp—a continuation of Moorfields—and before this massive building was raised, it was necessary to throw in an immense quantity of bush-wood, and to prepare an artificial foundation: upon this the hospital, designed by Mr. Dance, the architect of Newgate Prison, was placed. It is planned rather in the manner of a prison than an hospital for the cure of one of the most serious ills of humanity.

With thoughts of Hogarth's famous picture of a London Madhouse in our mind, we wandered with painful feelings through the bustling crowd to St. Luke's.

Clanking chains, straight-waistcoats, brutal violence, darkness, filth, and the most terrible neglect were looked upon in his days as the best means of restoring the insane to the world. The architect may therefore be to some extent excused for acting in the spirit of his time; and so came small lights, massive window-frames, which exclude half of the rays of the sunlight, the iron and wire work, and the little care taken for proper ventilation. Modern experience shows that the old terrors of the prison, brutal execrations and violence, and those even worse scenes which were exhibited for a small money payment to the curious, in the madhouses of the metropolis and elsewhere, were errors; and consequently in those buildings which were erected some time ago, it has been necessary to carry out changes, which are made at a large cost. St. Luke's Hospital was reared for about 50,000*l.*: during the last six or seven years 15,000*l.* have been spent in alterations, and very much more work remains to be done.

The general plan of this hospital is simple: the frontage extends 493 feet. In the centre is an entrance, with staircase, which divides the building into two equal parts, one of which is formed into apartments for males, and the other for females. The staircase is spacious, but the communication which it has with the cooking operations of the kitchen produces unsatisfactory results. The committee-room, and some of the dwelling-places of the superior officers of the Institution, are situated here, and on each side, the wards for the insane inmates stretch along. Through doors, kept carefully locked, we are admitted into a gallery of great length. The floor is now partly covered with cocoa-nut matting; the other part is painted with a black and white diamond pattern. The walls are neatly papered. At the time Dr. Stephens first became the resident medical officer of this place, these wards had a very different appearance; the brickwork was only imperfectly whitewashed, and a large portion of what is now the principal light of the ward, was blocked up. It is difficult to give an idea of the window-frames. The lower part is fixed; the upper part is moveable. The opening of these windows to the greatest extent, was not a means of ventilating the lower part of the room. When this condition existed,—when there was nothing but the bare boards, and the rough walls, it was necessary to wash the floor frequently. The want of proper ventilation at the right level, allowed the damp and unwholesome moisture to remain long. At this time erisypelas was very fatal in the building, and of common occurrence. Since the matting has been introduced, and the floor painted, which can be cleansed and rapidly dried, this disease has been of very rare occurrence. The wet scouring of floors in hospitals, where large numbers of persons are lodged, is open to objection, for the invisible emanations from the sick are absorbed into the woodwork, which, when wet, gives off unwholesome gases. These have bad effects; and experienced hospital physicians and surgeons rightly attribute many bad symptoms, in a measure, to this cause. The painting of the floors of hospitals, and even the rooms of dwelling-houses, is worthy of consideration. If matting or carpets be used, they should be frequently removed to some open place, and carefully dusted.

In those parts where alterations have not been made, there is a comparative gloom. In this curious London picture, which, sad as it is, has its bright side, when we consider the good changes which have been made, we see various neatly-dressed and lady-like young women, singularly different in appearance from the ideas which might be formed of those whose vocation it is to administer to the need of unfortunates of their own sex. A slender chain holds the key of the ward: but for this there is nothing to show their peculiar functions. On the papered walls are some excellent prints, framed, glazed, and mounted by the inmates of the place; and it is a fact worthy of notice that not one of the prints which are ranged round both the male and female wards has been injured. These works of art were the gift of Mr. Graves, the publisher, and will long serve to give pleasure to the inmates. It is an example worthy of imitation. In the light part of the ward a number of females are grouped together, some busy with needlework, others reading, some carefully wrapped up, lying on couches. Curious eyes peer out at the visitor, and solemnly still the place seems. The song-birds in a large aviary, and a parrot in another part, break the quiet; but the human portions of this scene are peaceable in the extreme. Here is a pianoforte, with some other means of amusement, books, a pet cat, but no restraints. "We have not even a straight waistcoat in any part of this house," said the medical attendant. In the darker parts there were figures shrinking, as it were, from the sunlight. The memory of some of these will for long remain. One young girl, with a beautiful face, her long hair flowing behind, led by an attendant, would have been a rare study for a painter. Let us hope the shadow may pass from this fair countenance, for we find that since the establishment of the hospital in 1751 up to the 31st of December, 1858, inclusive, there have been admitted into the hospital 19,463 persons deemed curable on their admission, of whom there have been discharged, cured, 8,667; uncured there have been 6,674; idiots, 1,882; over 500 have been removed by desire of their friends; 1,477 have died. But in the year 1858, of the males, there have been cured at the rate of 65·853 per cent.; of the females there were cured 64·705 per cent.

Proceeding from the main portion of the wards, with the exception of the part which has been thrown open to the light, are various small apartments, some of which are used as bedrooms, bathrooms, lavatories, &c. There is no overcrowding here at the present time, as the ventilation would not be sufficient, although the alterations just mentioned have been made. Wirework has been taken away, as have fireplaces, which projected some distance into the ward.

In passing through this and the other female wards where the most quiet of the patients are accommodated, women of different ages are seen, some working without object: one old lady, of pleasant countenance, is nursing a little doll, and pretending at the same time to be stitching; little snatches of song may be heard, and occasionally unmeaning laughter; farther on are heard rougher sounds, which come from the refractory part of the ward, where those who are more violently afflicted are kept. Here there is madness more distinctly shown. At the guard of the fire is a crouching figure: some are expounding in a thrilling manner religious truths; with loud and peculiar voices; language and countenances which to those who are unaccustomed to them are indescribable, are here, but all seem obedient to the management.

In the refractory wards wall papering has been introduced, but here it has been found necessary to panel the wall up to a certain height, with wood. Formerly, before Dr. Stephens undertook the medical superintendence of the hospital, these and the other wards were dingy, and the rough brickwork and heavy window gratings, were most unpleasant to the sight, while owing to the want of proper attendance the inmates camped themselves in parts like companies of wild Arabs.

The sleeping-rooms are arched with brickwork, of great strength, and the windows are most inconvenient. Throughout the entire building the extensive use of bricks is extraordinary; and there is a tradition here that the builder having married the daughter of a brickmaker, received her dowry in bricks, which he was glad to turn to a profitable account. Some of those rooms have been altered: the arches are removed, the lights enlarged, and other improvements made.

In the wards for the males similar improvements to those already mentioned have been made, and the authorities are anxious to remove the prison-like window-frames. To do what is needed, however, would entail a cost of not less than 2,000*l.* In these wards the fireplaces are left unprotected by guards; books and newspapers, bagatelle-tables, and other means of amusement are provided. The furniture here, as well as most of that which is used in other parts of the house, has been made by the inmates. Here, with the exception of the refractory ward, quiet and order reign, and even in the latter, where strong men are violent maniacs, the attendance of the keepers is all the force resorted to.

In this hospital 300 patients might be conveniently admitted, but at present the number is less than that. This is, unfortunately, not owing to any decline of the extent of lunacy in the metropolis, but to the ignorance of the public, and even of the medical profession, of the fact that this hospital is for all those who require or have just claims to its use. To those who are really in straitened circumstances this is a perfectly free hospital for the insane. Lately, persons have been admitted whose friends pay partially or wholly for their support, and much good has been done by that means. Owing to the diminished number of inmates, one of the large wards is unoccupied: this has been converted into a ball-room, in which the patients meet once a week, and it very rarely indeed happens that any one has to be removed for rude or improper conduct. The chapel might, at a very small cost, be much improved. Beyond, abutting into the grounds, is a spacious apartment, in which is a capital billiard-table. To add to the means of amusement, a gentleman has presented a complete scenic theatre, which the committee have had fitted up in a suitable building.

In addition to the exercise to be had here, the female attendants take out in rotation four or five patients for a walk in the streets. Many of the male patients have been trusted out on parole without any ill effects having resulted. By the arrangements which have been made more than half of the patients have had an opportunity of visiting the Crystal Palace, the Zoological Gardens, the British and Indian Museums, and the Water Colour Exhibitions.

The basement of the building, for some time past, has not been used for the reception of patients; it was, however, formerly so occupied, and remains since that time in parts unaltered. After passing through the neatly-fitted wards into this dungeon-like place, the contrast is extraordinary. Dismally dark as is this place now, it was worse until a wall, which hindered the light and air from entering, was removed. In these dark-arched and tunnel-like vaults are the kitchens and other

offices, and workshops of various kinds; on part of the ground, a laundry and other offices have been built,—the plan of them is not good.

In glancing at the general arrangements and present condition of this hospital, we cannot but admire the skill and ingenuity displayed by the resident medical officers,—but for the medical officers the condition of the place would have been most unsatisfactory;—and, as we have already stated, still further changes are needed, which will involve considerable expense. It has been properly urged that it is desirable to dispose of this building and site, and erect a new building in the country. We trust that if it is determined to retain this old hospital, vigorous means will be used to raise the sum necessary, to render it more fit for its purpose than it is at present.

ON DECORATIVE ART.

CORK.

ON the 28th ult. Mr. Edward Sheil, the late master of the Cork School of Design, delivered a lecture on "Decorative Art," in the Cork Institution. Mr. Sheil has given up his appointment, in order to visit Rome, and apply himself to painting. In the course of his address, after urging that artists must go to Nature for their highest combinations, he said:—

But Nature's glorious forms, could they be copied literally, are far too perfect and lovely in themselves to be used as secondary things to any work of man. The humblest flower, as the wild geranium, that grows on every bank, would far outshine, for grace, elegance, and marvellous detail, the richest tracery that ever encrusted a Gothic ceiling. Hence, man, though he must go to Nature for his forms and colours, must adopt a wisdom taught by experience, and be content with only a few of her beauties. The ornamentist is forced to select just as much as may give beauty to his works, and not put them to shame; but, whatever he takes he must hold sacred, and not trifle with; so that, as far as he goes, all who have studied Nature may recognize its truth. This I believe to be the true origin of that treatment of natural forms which is styled conventional, and which is a fundamental principle of all good design, and characterizes beautiful ornaments of all ages;—conventional treatment meaning an arrangement of natural forms, selected and drawn according to certain arbitrary laws. Thus, the cover of the book, which lost its proper character by decorating it with delicately-painted flowers, might have been rendered beautiful in its usefulness by the addition of a few simple lines, leaf-like in their curves, but geometric and unobtrusive. I say geometric, because reducing lines to follow certain laws is merely bringing them within the province of geometry, which establishes such laws with accuracy and truth. This conventional treatment of natural forms has been accounted for in many ways: some derive it from the example of the ancients, others from a horror in the artist of degrading Nature, by applying her forms unchanged to mean and inferior offices. But I fear it is a less noble motive which forces us to strip Nature of some of her glories, and fetter her with geometric forms. I fear it arises more from our secret vanity, which is deeply wounded when we see the hardest work of our hands and brains obscured by the wealth of beauty in any of Nature's works. Now, it might be asserted, with seeming truth, that the copying of any natural form, by man's handicraft, must necessarily be so imperfect as to require no conventional means of degrading it; but admitting that the representation, however perfect, is far inferior to nature, yet, because it is man's greatest effort assisted by nature, it must still be far more perfect than man's work unassisted by nature, and therefore unfit to occupy the place of decoration. Having proved, then, the necessity for conventional treatment, and been convinced that the broad field of heaven's work is the great emporium from whence we must draw our knowledge, it is clear that the first step to acquire skill in designing fitly and grandly must be to acquire as intimate and accurate a knowledge of natural forms as our powers permit; and if this is true of all such forms, it applies with greater force to that form which the universal voice of mankind has proclaimed the noblest and most beautiful of all, namely, the human form. The changes that take place from youth to age in a leaf or branch, or even in one of the lower animals, produce no great difference in our ideas of them through all the periods of their existence; but, in the human form, how distinct are our ideas of childhood, manhood, and old age? Innocence and youth, strength and experience, wisdom and infirmity, pass, one by one, across the lines of the face, which become arched, straight, crooked, or all three combined—as each age and passion thinks fit to impress them. A line in this case is more than a line, it is a short biographical history. It is a mere truism to say, that the perfect human form is the highest manifestation of God's power upon earth; and as this form is but the external covering of an infinitely complex structure of bones and muscles, which change with every affection of the mind, it is almost impossible by any study thoroughly to understand it. Hence, to draw the human figure well is at once the triumph and the test of an artist's skill. All great schools have founded their knowledge on it.

History proves that it was thus the greatest ornamentists aimed at excellence. The ages which have been most illustrious in great artists were also those that heralded or commenced the best ages of ornamental art—as the ages of Phidias, Paul Veronese, and Raffaelle. Hence the proof of my second and third propositions—namely, that art knowledge should be acquired by all classes, and not be confined to one. That this art knowledge must be formed on the study of nature alone, particularly on the human figure. The best practical illustration of the truth of these conclusions consists in the fact, that the schools of design, which were founded on principles contrary to them, failed in realizing the objects for which they were instituted; till at last, under the masterly guidance of the present head of the department, the whole system has been remodelled, to suit all the wants of the nation, and now embraces amongst its students every class in the community,—manufacturers, general art students, and designers; whilst its system of instruction offers almost equal encouragement and honours to every branch of art, decorative or pictorial.

SANITARY CONDITION OF LONDON.

STATE OF THE CHURCH VAULTS.

IN his last report, as medical officer of health for the City of London, Dr. Letheby says:—

"In the corresponding quarter of last year the total number of deaths among the City population was 829, and during the same period of the last ten years the average mortality has been 763; whereas in the thirteen weeks of the last quarter there were but 730 deaths among the inhabitants of the City. This shows an annual saving of 132 lives, or about four per cent. of the whole mortality; and, as I shall presently show, it has been chiefly among adults. As usual, however, the improvement of the death-rate, as well as the distribution of deaths in the several unions, has been very unequal. In the western division of the City, for example, with a population of 28,600, there were 190 deaths; in the eastern division, with about 44,600 inhabitants, there were 285 deaths; and in the central, with about 56,000, there were only 255. These are at the annual rate of 26·6 per 1,000 in the first-named union, 25·6 in the second, and only 18 in the third, the mortality of the whole City having been at the annual rate of 22·5 per 1,000. This inequality of the death-rate is sufficiently striking to show that much remains to be done for the sanitary improvement of the City; for although it is not possible to say from physiological data what should be the duration of life, or what the standard of mortality, yet it is manifest from the very inequality of the death-rates that there must have been in some parts of the City an excessive waste of human life. If this is measured by the actual standard of mortality in the whole of England it becomes still more apparent. At this season of the year the mortality in this country is at the annual rate of 21·8 per 1,000 of the population. In the town districts it is 25·2, and in the rural divisions only 18·7; while in many places, scattered over the surface of the country, with every variety of situation, and with a large aggregate population, the mortality is only 15 per 1,000."

Examinations have been made of the vaults under the City churches, seventy-one in number, and it is shown that in some the vaults are even now gorged with corruption, the only partition between the living and the dead being a thin slab of stone and a few inches of earth.

"As far as our investigations have gone," says the officer of health, "we have found about 259 vaults in the City churches, half of which are public; and although it is not possible to obtain accurate information of the number of coffins within them, there is reason for believing that the number is not far short of eleven thousand; besides which there are hundreds of bodies in the graves of the aisles and porches. In most cases the vaults are entered from the general area of the church, the openings being covered by wooden flaps or by stone flags. The coffins are generally of lead, with an outer covering of wood, and they are often piled up in tiers to the very crown of the vault. When the wood decays, the weight of the upper mass crushes the lead and lets out a filthy liquid of a most disgusting odour. But besides this process of destruction, the lead itself is attacked by the foul gases, and is pierced with numerous holes, as if it were worm-eaten. It then swells up into a spongy mass of porous carbonate, which offers but slight resistance to the passage of putrid vapours; and thus, little by little, the animal part of the body escapes and finds its destination. It is a huge fallacy to suppose that a coffin of lead preserves a corpse indefinitely. The law of nature is that organic matter shall not be idle, it must ever circulate and be in motion."

Years have passed since we set forth the condition of the London vaults in this respect. When we published a view of the vaults beneath a celebrated City church (not one of the worst either), under the title of a Fever-Still, it excited a burst of indignation, and aided in leading to the legislation which has checked, if not stopped the burial of the dead in the midst of the living; but the vaults in many cases appear to have remained in their original abominable state. In consequence "at the night services, or during the winter season, when the air is rarefied by the warmth of the fires, or burning gas, the rank vapours are drawn out in uncontrolled profusion. It is impossible to say what mischief has been done by this, and how many, while worshipping within the sanctuary, have breathed the atmosphere of corruption, and have sickened unto death."

Dr. Letheby appears now to be doing all that is in his power to fill up the vaults, so as to prevent the escape of noxious gases.

FOUNDATION OF THE ROYAL ACADEMY.

THE *Critic* prints the prospectus originally published on the incorporation of the Academy in 1768. It is dated December 10th, and sets forth that,—

"The principal object of this institution is to be the establishment of well-regulated schools of design, where students in the arts may find that instruction which hath so long been wanted and so long wished for in this country. For this end, therefore, there will be a winter academy of living models of different characters to draw after, and a summer academy of living models of different characters to paint after: there will also be laymen with all sorts of draperies, both ancient and modern, and choice casts of all the celebrated antique statues, groups, and basso-relievos. Nine of the ablest academicians, elected annually from amongst the forty, are to attend these schools by rotation, to set the figures, to examine the performance of the students, to advise and instruct them, and to turn their attention towards that branch of the arts for which they shall seem to have the aptest disposition.

And in order to instruct the students in the principles, to strengthen their judgments, to form their taste of design and colouring, to point out to them the beauties and imperfections of celebrated performances and the particular excellencies and defects of great masters, to fit them for an unprejudiced study of books, and to lead them into the readiest and most efficacious paths of study, there are appointed a professor of painting, a professor of architecture, one of anatomy, and one of perspective, who are annually to read a certain number of public lectures in the school, calculated for the purposes above recited.

Furthermore there will be a library of books of architecture, sculpture, painting, and all the sciences relating thereto; also of prints of bas-reliefs, vases, trophies, ornaments, ancient and modern dresses, customs and ceremonies, instruments of war and arts, utensils of sacrifice, and all other things useful to students in the arts.

The admission to all these establishments will be free to all students properly qualified to reap advantage from such studies as are there cultivated."

Thomas Sandby was professor of architecture, and Sir William Chambers was treasurer. The king had apparently sanctioned the establishment of the Academy in 1767.

PRESERVATION OF BUILDINGS FROM WHITE ANTS.

SIR,—I am directed by the Secretary of State for India to transmit herewith a printed paper recently received from India, on the subject of the preservation of buildings from the ravages of white ants, to which you may probably be able to assist in giving publicity. W. T. THORNTON.

India Office.

Mems. by Capt. A. Fraser, Engineers.

In 1836 the flooring and the powder racks in the King's Magazine in Fort William were so far destroyed by white ants, that it was found necessary to renew entirely the former, and nearly the whole of the latter, at a very great expense.

I was then garrison engineer; and, on a suggestion of Major Weller, of the engineers, who had tried the experiment at Loodianah, on his own premises, on a small scale, I adopted the following plan in renewing the floors, &c., of the building:—

1st. The whole of the old floor was removed, and the

plaster of the walls stripped off to a height of 4 feet above the floor line.

2nd. The earth in the interior was dug out about 1 foot in depth.

3rd. The excavated portion was filled in with concrete, containing a proportion as per note,* to yellow arsenic, called in the bazaar "hurtal."

4. Above this floor were raised pillars with proper foundations, upon which rested the joists, which were painted: the floors were laid with 3-inch planking, but not painted.

In the mortar used for the pillars was also an admixture of the arsenic, in the proportion of ½ lb. to 100 cubic feet of brick masonry, and in the paint a small quantity of the arsenic was in like manner used.

5. The first 4 feet in height of the magazine was replastered with sand plaster, in which was also contained arsenic in the proportion of four chittacks (½ lb.) to 100 superficial feet of plaster.

6. The whole of the racks were painted with white paint, and the whole of the interior of the magazine whitewashed, both the paint and the whitewash also containing small quantities of the "hurtal."

In 1856 not only the building, but the whole immediate neighbourhood was swarming with white ants; and in 1859 the Town Major was requested by the Government to make a report as to the effect of the above measures, and annexed is a copy of his reply.

[The reply says,—"No traces of white ants have been found either inside or outside the building."]

Memo. by Captain Man.

"In 1849 I substituted a planked for a tiled flooring in a room on the ground-floor of my house at Singapoor. This was entirely destroyed by white ants in a few months. I re-laid fresh joists and planking painted over with the gambier composition, and within two or three days the white ants made their appearance through the crevices between the tiles of the adjoining room, being apparently unable to remain in the vicinage of the protected planking.

I lived in the house for several years afterwards, and the flooring seemed to be in excellent order when I left. I have tried gambier as a preservative against the 'teredo navalis' and with equal success, but then I substituted tar or black varnish for dammar oil. I have used it largely on the piles of wooden bridges near the sea and other exposed situations, and after several years' trial found the timber perfectly free from these destructive animals. I recommended this composition to my successor, Captain McPherson, and he has adopted it with equal success on many occasions.

Gambier Composition.

Dissolve three pints of gambier† in twelve of dammar oil over a slow fire; then stir in one part of lime, sprinkling it over the top to prevent its coagulating and settling in a mass at the bottom: it must be well and quickly stirred. It should then be taken out of the cauldron, and ground down like paint on a muller till it is smooth, and afterwards returned to the pot and heated. A little oil should be added to make it tractable, and the composition can then be laid over the material; to be treated with a common brush.

Against the teredo I substituted the same proportion of black varnish or tar for dammar oil. I of course omitted the grinding down, which would not answer with tar."

From Col. W. Scott, Acting Chief Engineer at the Presidency, dated December 24th, 1858.

"My Lord,—In reply to the second paragraph of the Resolution under Mr. Chief Secretary Young's memorandum, No. 3,473, of the 14th instant, I have the honour to report that a rule has been in force for some years to eradicate white ants' nests near public buildings. It has, in some cases, been found very effective, but in others white ants abound in places where the nest cannot be discovered, and not unfrequently there are several queens in one nest.

2. Major North used to soak his timber at Belgaum in a hot solution of sulphate of copper, and the immediate effect was very satisfactory; but Captain De Lisle, from careful experiments with deal, found that the penetration was scarcely appreciable; the effect, therefore, cannot be permanent.

3. When timber is boiled in an antiseptic solution under pressure, the result is very satisfactory, but considerable apparatus is requisite, and the system cannot be economically employed except on a large scale.

4. A mixture of sulphate of copper, or of arsenic, with the lime, in immediate contact with timber, offers, perhaps, the most ready method of preserving it from insects: corrosive sublimate combines with lime, and forms an inert substance (yellow wash of medicine).

5. I have circulated the receipt given below, which is said to answer in the Madras presidency, and requested executive officers to apply it where necessary, taking precautions that it is not applied where it may be accessible, or over any extensive surface:—

Poison for White Ants.

	lb.		oz.	
Arsenic	2	....	4	
Aloes	2	....	4	
Chunam soap ..	2	....	13	Common country soap.
Dhobies' mud....	2	....	8	Khar.

Pound the arsenic and aloes, scrape the soap, mix with mud, and boil in a large chatty half-full of water until it bubbles; let it cool, and when cold, fill up with cold water. The mixture should be boiled for an hour: it is applied as a wash."

VALUE OF LAND IN THE CITY.—At a sale of a portion of the site of the old Rainbow Tavern adjoining the Union Bank, Fleet-street, on Saturday, the 14th instant, the price realized was at the enormous rate of 900,000*l.* per acre.

* Two seers (4lbs.) of the yellow arsenic to the 100 cubic feet of concrete.

† Gutta Gambier is juice extracted from the leaves of a plant of the same name (*Uncaria Gambier*) growing in Sumatra—inspissated by decoction, strained, suffered to cool and harden, and then cut into cakes of different sizes or formed into balls. Chief places of manufacture—Siak, Malacca, and Bintang. It is used by the Malays with the leaves of betel, in the same manner as *Cutch* (or *Catechu*) in other parts of India. For this purpose the finest and whitest is selected: the red being stronger tasted and rank, is exported to Batavia and China, for the purposes of tanning and dyeing.

THE PROGRESS OF THE ELECTRIC TELEGRAPH.

IN various parts of London, high above the busy thoroughfare, numerous workmen are busily employed in passing the electric wires from one situation to another. These will ere long form a curious and striking feature of the streets of the metropolis. Every week this means of communicating information is being more adopted; and, as we have before said, the electric telegraph will prove a means of increasing the power of the police, of spreading the alarm of fire, and important for many purposes of business: it is not unlikely that the laying on of the telegraph, in important establishments, printing offices, &c., will become as necessary as in the case of gaslight and water. Who can say how ultimately this marvellous invention may affect our present post-office system, or to what extent the streets overhead may be covered with wires, like a spider's web? It may be, in business, that the art of working the telegraph may be as necessary as that of writing, and be made a matter of school education; and that tall chimneys and other lofty objects will have a value which is at present not thought of.

GIFTS OF THE LATE MR. MINTON.

I HOPE you will put on record in the pages of the *Builder* my late friend Mr. Minton's many gifts of beautiful tiles towards the beautifying of God's house of prayer in divers places.

I send you a list as printed.

At the same time commending the introduction of the memorial tile, which I have laid down here (Clyst St. George) to record his gift. It is 12 inches square, and works in well with the other tiles.

The old floor of this church was covered with tomb stones; many of them broken and obliterated. It was my own idea to transfer the names and dates to tiles 12 inches square. Mr. Minton fell in with it, and at once offered to give the pavement for the nave, and these memorial tiles are worked in and form a beautiful design.

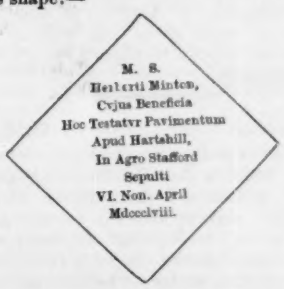
We have no right to destroy the records of the dead; as has been ruthlessly done in many churches where tile pavements have been laid down. By introducing these memorial tiles, a beautiful and imperishable record may be substituted.

Besides Mr. Minton's gift, the floor of an aisle has been given, and treated in the same way; and now we have twenty of these memorials, besides the one to Minton's memory.

H. T. ELLACOMBE.

*** The list, for which we cannot give space, occupies six octavo pages. It will be found in "Annals of the Diocese of Lichfield, Past and Present."

The memorial tile inserted in the pavement of Mr. Ellacombe's church, Clyst St. George, Devon, takes this shape:—



BUILDING FOR THE PROVINCIAL WELSH INSURANCE COMPANY, WREXHAM.

THERE is but one Welsh Insurance Company, and for this the first stone of a new building in Wrexham was laid on the 3rd instant by Lady Williams Wynn, with some ceremony and great rejoicing. The Welsh Insurance Company was established in April, 1852, for the insurance of property against fire.

The first 10,000 shares of the company were taken up immediately, and the issue of an additional 10,000 shares became necessary to meet the demands of the public. The whole 20,000 were taken up by about 800 persons. A large staff of agents was soon appointed in the United Kingdom and Ireland. A large proportion of the agents from the commencement have been shareholders, so that a vitality was given to the company, at first, which has steadily increased in strength, until up to the present time nearly 20,000 policies have been issued, insuring property to the amount of 7,347,605*l.* The life assurance business was commenced in 1854. The site of the new offices is on the south side of High-street, nearly opposite to the office at present occupied by the company, where a block of unsightly dilapidated old buildings has been removed to make room for the new offices, designed by Mr. R. Kyrke Penson, and now in course of erection by Messrs. Lockwood & Farrimond, of Chester. At the entertainment which followed the event reference was made to the energy and ability with which Mr. Dillon, the manager of the company, had conducted its affairs.

WESTMINSTER ABBEY.

SIR W. D'AVENANT'S GRAVE-STONE.

AS attention has lately been drawn to Westminster Abbey by the *Builder*, as well as by the funeral of Lord Macaulay, it has occurred to me that the present is a suitable time to put a question to the dean and chapter or their architect, which I should like to have answered. Some six or seven years ago, strolling in the cloisters, I observed a small slab of stone broken across, with this inscription:—

"O Rare
Sir William D'Avenant;"

which seemed to identify the stone as having been placed over the grave of the poet of the Restoration.

I do not know where he is buried, so have not been able to ascertain if the slab was ever replaced; perhaps Mr. Scott or some of your correspondents can inform me. J. H.

THE ARCHITECTURAL MUSEUM.

PRIZES FOR WOOD-CARVING.

THE prizes for wood-carving have been awarded as follows:—First prize, 5*l.* 5*s.* (offered by the council of the Architectural Museum), to Mr. James Allen, in the employment of Mr. J. B. Philip; an extra prize of 5*l.* 5*s.*, added by the council, to Mr. William Baylis, of 3, Warwick-place, Bedford-row. Second prize, of 3*l.* 3*s.* (offered by Mr. Beresford Hope, the president), to Mr. Charles E. Turner, of 13, Upper North-place, Gray's-inn-road. The prizes will be presented on Wednesday, March 7th. We take the opportunity of adding that the council are soliciting donations in aid of the prize fund for this year. Mr. G. G. Scott, the treasurer, or Mr. Clarke, the honorary secretary, will be happy to receive promises of assistance.

BRIGHTON AND SUSSEX SCHOOL OF ART.

THE first annual meeting of this school has just been held, in the Townhall, Brighton, the Rev. Mr. Griffith, Principal of Brighton College, in the chair, in the absence of the mayor, from indisposition. The report stated that the entire number of persons taught by the art-master (exclusive of private pupils) during the past year was as follows:—At public schools, 500. At the School of Art,—Day classes: gentlemen's (A), 11; ladies' (B), 31; total, 42. Evening classes: Artisans, &c., (C and D), 112; schoolmasters, 5; schoolmistresses, 4; pupil teachers, 28; other females, 26: total, 175. Making the total in the School of Art, 217; of whom the great majority would have obtained *no* instruction in elementary art but for the establishment of this school. In point of finances, the result of sixteen months' operations is a balance of 22*l.* 10*s.* 1*d.* in the treasurer's hands. The committee had at no time been in debt. Mr. W. W. Attree, in moving the adoption of the report, said that if they would give a little consideration to what had been the source of progress in all successful schools of art, they would find that it had been patient, steady, "noble correctness," as it had been well called; and one of the deepest thinkers of our country had said, that of all things that he had any idea of in art, the one that struck him most, as a distinctive characteristic of art, was the mechanical portion of it; and that was the particular thing specially pointed out in the report. That "noble correctness" can only be obtained by constant perseverance and the most accurate study; and, so far as he could learn, that had, in all schools, been the necessary foundation upon which success had been built. They all knew the story of the great master of Italian art, who, when asked to give a specimen of his skill, sent a single curve so accurately done that it had passed into a proverb, and when we would express that a thing is excellent and perfect of its kind, we say that it is "Round as Giotti's O." And that was the foundation of a great and noble school of art. This "noble correctness" lay at the bottom of all art:

it was the only superstructure upon which great artists had rested, or ever could rest their hopes of success. The prizes were afterwards distributed in the usual form.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE ANNUAL MEETING.

THE first annual meeting of this association was held on Tuesday, in the Old Castle, Newcastle-upon-Tyne, Mr. Watson, in the chair. Routine business having been transacted, a report was read by the secretary, and afterwards unanimously adopted by the meeting. In this it was said,—

"At the first quarterly meeting, held, by the courtesy of the Society of Antiquaries, in their rooms in the old Castle, Newcastle, the inaugural address was read by the president, John Dobson, esq.; and on the 6th of July the annual excursion meeting was held at Finchall Abbey, attended by a large party of members. During the examination of the ruins several interesting discussions took place, and some valuable sketches and measurements were obtained. The party afterwards visited Lumley Castle, and made a careful inspection of the more valuable features of the edifice, and returned home much gratified with the day's excursion. Your committee wish especially to draw the attention of the members to the advantages obtained by these excursions in connection with the society. The second quarterly meeting was held on the 19th July, when a paper was read by Mr. Austin on 'English Architecture of the latter half of the Twelfth Century,' which was illustrated by various diagrams. The third quarterly meeting was held on the 10th of October, when Mr. Dunn read a paper entitled 'Notes on Continental Architecture,' which he illustrated by sketches made on the spot. Not the least gratifying part of the report which the committee have the pleasure of submitting to you is the highly satisfactory statement of its financial condition, which enables them to say that, after having paid the preliminary expenses, the outlay involved in the publication of the papers, and all incidental expenses, there will be a balance in the hands of your treasurer."

The election of officers for the ensuing year was made, as follows:—President—Mr. Dobson. Vice-President—Mr. Wardle. Honorary Treasurer—Mr. Austin. Honorary Secretary—Mr. Oliver. Committee—Mr. Dunn, Mr. Watson, Mr. Greener, Mr. John Lamb, and Mr. Haswell.

After a conversation, the secretary was instructed to forward, without delay, to the secretary of the Bishop Auckland New Town Hall and Market Company, an extract from the minutes of the resolutions passed relative to a competition for designs, advertised for by the directors of the company, for a Town Hall and Market at Bishop Auckland.

THE RHINE BRIDGE.

ON Saturday, the 24th December, at seven p.m., the foundations of the fourth and last pier of the celebrated railway bridge over the Rhine were sunk to the required depth of 20 mètres. Thus, the four piers are completed. The first was sunk in fifty-three days; the second in thirty-one; the third in twenty-five; the fourth in eighteen days. These are all taken as days of effective labour.

The abutments remain to be constructed. The cube of the foundations of the four piers is 12,000 mètres of masonry. The quantity of gravel excavated is 17,000 mètres.

The works of the line from Kehl and from the Kintzig-bridge advance rapidly. Next September the line will be open throughout, and the journey from Paris to Baden-Baden will be performed in ten hours.

THE SOCIETY OF FOREMEN ENGINEERS.

EVERY one is aware of the value of the steam-engine to the inhabitants of the earth. Whether it be employed in the propulsion of vessels, despite the hostile influences of wind and tide, to and fro between the most distant regions, and thus facilitating the exchange of the varied products of every country; whether in the form of the locomotive, whisking passengers from one extremity of the kingdom to the other, and "annihilating time and space;" or whether in the stationary form engaged in the execution of works of the most ponderous and the most minute kind, the steam-engine is equally important, valuable, and wonderful. Surely, then, the well-being and progress of the men—for the most part self-raised men—who overlook their construction, the foremen engineers, have a claim on the consideration of all.

It is impossible to watch the construction of any intricate piece of machinery in an engineering establishment without admiring the careful attention given by all concerned in "setting it out," and in practically developing it. And certain it is that no man is ever selected for the post of foreman over the workmen employed in perfecting machinery who is not at once able, steady, and economical—that is, economical of material. Hence to say that a man is a foreman engineer is to give him a good character. This fact we commend to the attention of all. The Association of Foremen Engineers has its meetings, monthly, at No. 35, St. Swithin's-lane, City, and is, apparently, in a prosperous condition, financially speaking. To quote briefly from the preface to the rules, it may be said that "The Association of Foremen Engineers does not discuss on any occasion the politics of trade. It has no secrets, but wants rather complete publicity. Its objects are purely and solely philanthropic and instructional. It essays to assist its members in fairly, creditably, and peacefully filling the important posts confided to them; to relieve them under pressure of incidental difficulties; and to afford timely assistance to their sorrowing relatives when the wings of death overshadow them, and make their homes desolate."

This extract gives with sufficient distinctness the aims and objects of the Association; and we feel convinced that in making it better known we are conferring a good upon society. Already, we learn, that nearly 100 members are on its books, and we feel assured that that number will steadily increase, until representatives of every engineering establishment in London are to be found united to it.

One of the rules enacts that no candidate can be accepted who has not held the position of foreman engineer for at least two years prior to his application for the privileges of membership. The entrance-fee is one guinea; the subscription, 2s. 6d. per month. Mr. Joseph Newton, foreman of the coining rooms, Royal Mint, is president; and Mr. John Jones, of Messrs. Grissell's, Wharf-road, City-road, secretary of the Association.

SMALL-POX.

THE great increase and continuance of small-pox are causing much anxiety, and in many parishes notices have been issued directing attention to the necessity of vaccination. Knowing something of the feelings of the poor (who suffer most), we may say that in addition to much carelessness in taking the children to be vaccinated, doubts exist respecting the effectiveness of vaccination, and fear lest other and permanent diseases may be generated. These matters are well worthy of immediate consideration, and means should be used to set the public mind at rest on the matter. In several neighbourhoods occupied by the poorest, owing to unwholesome conditions and other causes, the deteriorated condition of a large number of children is deplorable. Scrofula and other complaints affect so many constitutions, that it is not a very easy thing to find, without looking abroad, a sufficient number of healthy children from whom to procure the necessary quantity of good vaccine. The sum allowed to the medical men who attend to the vaccination of districts, is small, and does not induce much care. The present Act, it is said, cannot be properly carried out: it is, in fact, unworkable.

TIMBER MEASURING IN IRELAND.

TOUCHING the "string and calliper" war now raging between the Dublin builders and the Messrs. Martin and Son, timber merchants in that city, and in addition to the particulars already given, we find that Mr. Barcroft, timber broker and measurer, in reply to the request of the Association, writes: "In accordance with an experience extending over twenty-five years, I have found a difference in favour of the string of from five to twenty-five per cent., according as timber was squared or wany, and agree with Mr. Challoner that it is necessary to have a sworn measurer to act between merchant and purchaser, to prevent frauds being practised by unprincipled parties, especially upon public companies." Mr. Barcroft proposes a deputation of builders, retail timber merchants, and cabinet makers, to wait upon Messrs. Martin, with a view to amicable arrangement. *One in the Trade* replies to Mr. Challoner's letter that he, being a Liverpool timber-broker, takes an unselfish (?) interest in the Dublin timber trade, and that having an aversion to a change that would dispense with his services, he leaves the public to judge how far his statements may be biassed. Further, that the custom-house officer who measures by "calliper" ought to be protection enough between merchant and trader without the intervention of a second measurer at cost to the latter. Timber is sold by calliper in *all* the Irish markets and the English ports except Liverpool; and concludes that Mr. Challoner is not to be blamed, being only attending to his business in trying to divert the trade to Liverpool.

IRISH NEWS.

THE Enniskillen terminus of the Dundalk and Enniskillen Railway, recently erected from designs by Mr. William G. Murray, architect to the company, is an important structure, with a platform towards rails extending 300 feet, and a similar frontage towards street. The main building—which is two stories high — comprehends, on ground-floor, a central booking-office, 30 by 17, approached under a covered way or verandah from the exterior, and wings with gentlemen's and ladies' waiting-rooms, left-luggage room, and master's kitchen, respectively, with spacious apartments for the master above likewise; together with one-story wings containing refreshment-room, kitchen, and yard, at one side, approached from platform; and superintendent's office, porter's stores, water-closets, &c., at the other. The expenditure was about 4,500*l.*, and the materials employed, limestone, from Carrickrea quarry, hammer-dressed, with Cairnmore quarry sandstone for quoins, window and door opes, chimneys, bases, &c. The same company have also erected stations at Ballybay (cost 1,700*l.*), Newbliss (ditto), Clones (2,500*l.*), Newtown Butter (1,400*l.*), and Lisnaskea (1,500*l.*). Mr. John Nolan, of Dublin, the builder of all. The above amounts are exclusive of extras.

COMPETITION FOR THE HARTLEY INSTITUTION, SOUTHAMPTON.

WE have received several letters directing attention to a preposterous communication addressed to the *Hampshire Independent*, the object of which is set forth in this extract from it:—"I do not object to plans being obtained through public competition, yet I most decidedly think *a preference should be given to a local architect*, provided his design embodies the requirements as set forth in the scheme issued by the council, and that it will not exceed *in cost* the sum at their disposal." And he goes on to request the committee without fail to include amongst the designs "selected for their final consideration those sent in by the architects of the town," showing the value he attaches to the fact that the drawings are submitted under mottoes.

We cannot suppose that such a communication will prevent the council from coming to a decision on the merits of the designs alone; but it is as well that the peculiar views which exist on the subject of competition should be known.

SCIENTIFIC INSTRUCTION TO THE INDUSTRIAL CLASSES.

EXAMINATIONS of teachers in competency to afford scientific instruction to the industrial classes were held at the "South Kensington" Museum in November and December last. The certificates are of three grades, giving the teacher who obtains them annual payments, whilst teaching, of 10*l.*, 15*l.*, and 20*l.* for each subject. The following is a list of the successful candidates in the first two subjects:—

SUBJECT I.

Practical Plane and Descriptive Geometry, Mechanical and Machine Drawing, and Building Construction.

SUBDIVISION I.—*Practical Plane and Descriptive Geometry.*

Nine candidates, all of whom failed.

SUBDIVISION II.—*Mechanical and Machine Drawing.*

Second Grade Certificate.—Washington Hudson, Eagle Foundry, Hunt-street, Manchester. Four failed.

SUBDIVISION III.—*Building Construction, or Practical Architecture.*

Second Grade Certificate.—Washington Hudson, Eagle Foundry, Hunt-street, Manchester.

Third Grade Certificate.—William H. Goodwin, Marquis of Salisbury's School, Hatfield. Four failed.

SUBJECT II.

Physics, Mechanical and Experimental.

SUBDIVISION I.—*Mechanical Physics.*

Second Grade Certificate.—Isaac Seaman, 18, Cumming-street, Pentonville; Bentham Simpson, St. Matthew's School, Bethnal-green.

Third Grade Certificate.—Joseph Hough, Mechanics' Institute, Leeds; Walter Jeffery, Blue Coat Hospital, Gloucester; Edward Atkins, St. Martin's School, Leicester; Moses Pullen, National School, Painswick, Stroud; Robert J. Nelson, Navigation School, Mercers'-street, Shadwell. Five failed.

SUB-DIVISION II.—*Experimental Physics.*

First Grade Certificate.—Walter Jeffery, Blue Coat Hospital, Gloucester.

Second Grade Certificate. — Bentham Simpson, St. Matthew's School, Bethnal-green; George C. T. Bartley, 1, Rectory-place, Stoke Newington.

Third Grade Certificate. — Isaac Kerby, St. Mary's School, Putney; Edward Atkins, St. Martin's School, Leicester. Six failed.

THE STONE USED IN WESTMINSTER ABBEY.

On reading your report of the proceedings at a meeting of the Royal Institute of British Architects, in your edition of the 24th ult., it occurred to me that the stone partly used in the erection of Westminster Abbey, and described by Mr. Scott as "Beer or Bur, and from Stapleton, which he supposed to be near Pontefract," must be the Beer and Silverton stones, the same as used in building Exeter Cathedral; for, according to the Fabric Rolls of that beautiful work, it appears that it was built of stone from different quarries; the walls, of Beer, near Colyton, Devon; the vaulted roof, from the quarry at Silverton, in the same county; and the clustered and small pillars, with their capitals (idly supposed to be artificial composition), from the Isle of Purbeck, in Dorsetshire.

I hope these few remarks may be of some value in deciding the exact locality from which the stone used in Westminster Abbey was taken.

THOMAS G. BROWNING.

APPEAL AGAINST CONVICTION OF WORKMEN FOR INTIMIDATION.

At the Surrey Sessions, on the 16th instant, the appeal of Jenkins, Stanley, and Davis, society men, against the conviction of Mr. Elliott, was heard, in the New Court, before Mr. J. E. Johnson and a full bench of magistrates. The appellants in this case belong to the Builders' Society, for the protection of the men on the late strike and lock-out; and on the 9th of November last they were all charged at the Lambeth police-court with using threats and intimidation to John Roy, a bricklayer and a non-society man; and the case having been proved to the satisfaction of Mr. Elliott, the sitting magistrate, he sentenced Stanley and Jenkins to one month each, and Davis to fourteen days. The appeal lasted nearly the whole day.

Mr. Robinson, for the appellants, contended that it would be much better for the Court to let the matter drop by the men entering into their recognizances. The strike was now over (?), and the men saw their folly, and he was sure that a repetition would not occur. The charges against the defendants could not be supported, therefore he now suggested that the appeal should stand over, with the view of its ulterior abandonment.

Mr. Knapp objected to that course. It had been clearly shown to the magistrates that intimidation had been used, and it was necessary that the case should proceed.

The Court was of the same opinion, and the evidence, accordingly, was re-heard. At the close,—

The chairman said that the Court was unanimous in their judgment, and confirmed the convictions; and they regretted that a body of men should have been so foolish as to combine for such a purpose, and hoped it would not occur again.

The defendants were then taken into custody. Jenkins and Stanley stand committed for one month, and Davis fourteen days, with hard labour.

ACTION FOR DILAPIDATIONS.

HIS ROYAL HIGHNESS ALBERT EDWARD, PRINCE OF WALES, *v.* HEATHER.

This was a suit promoted in the Sheriff's Court, on behalf of his Royal Highness the Prince of Wales, as Duke of Cornwall, for dilapidations arising under five leases, comprising thirty-one houses at Kennington, in Surrey. The damages were laid at 1,000*l*. The first count of the declaration recited a lease of 4th March, 1833, between his Majesty King William IV., of the one part, three officers of the Duchy of Cornwall on the second part, and the defendant of the other part; and a demise of fifteen houses in Golden's-place, Chester-street, Kennington, part and parcel of the demesne lands of the manor of Kennington, and part of the ancient possessions of the duchy. There were the usual conditions as to repairs, and the other counts recited at length the demise of the other houses held by the defendant under the duchy. It alleged that the reversion expectant on the determination of the term had become vested in the plaintiff in right of his Duchy of Cornwall; and the breach set forth was that—whilst the plaintiff was so seized of reversion, and whilst the defendant was possessed of the premises, and before suit was commenced—he did not sufficiently repair according to the covenants, and the premises in consequence became ruinous and decayed, &c.

Sir W. J. Alexander and Mr. Garth appeared for the plaintiff, instructed by Messrs. Lyon, Barnes, and Ellis, of Spring-gardens, solicitors to the Duchy. The defendant was not represented, and the only question was as to damages. The evidence was of the usual character as to dilapidations, and the jury assessed the damages at 300*l*.

GLASS.—A steel drill, hardened and used without drawing the temper, will, if the point be kept wet, drill ordinary glass. Window glass offers greater resistance to drilling than glass which is much thicker.

Books Received.

Practical Remarks on Belfries and Ringers; with an Appendix on Chiming. With Illustrations. By the Rev. H. T. ELLACOMBE, M.A. &c. Bell & Daldy, 186, Fleet-street, London. 1859.

THE Rev. Mr. Ellacombe is a well-known authority on the subject of bells and bell-ringing, as many of our readers are doubtless aware, even from our own pages. A pastorly desire to reform the moral characters of the "idle and drunken" bellringers appears to have actuated the reverend gentleman, no less than his interest in the subject of bells and belfries. The book under notice contains a set of rules for ringers which it would be worth while for others of our many clerical readers to consult, as well as remarks on the formation of belfries useful to our architectural readers. The Appendix gives a full account of an ingenious plan of chiming devised by Mr. Ellacombe.

The meaning of the phrase "a peal" has curiously changed.

"With the half wheels the bells were not raised to a set pull, but rung a little above stock level and kept there a certain time, and then ceased; and so the ringing would be continued, and each time of its repetition was called a peal; and supposing this to be correct, it is more easy to understand the meaning of so many peals in a day."

"The ringing even of a single bell for any length of time would be called a peal, and so it is now termed, particularly in the North, where single bells prevail."

VARIORUM.

"LES Grandes Usines de France," partie 1re: Algar, Clements-lane, London. Under this title it is proposed to describe and illustrate the most important manufactures of France. The first part contains an interesting account of the *Gobelins* manufactory, with several engravings. ——THE current number of the *Ecclesiologist* contains two interesting views of the Choir of Lichfield Cathedral, as proposed to be fitted under the direction of Mr. Scott, one looking westward, showing screen and stalls, the second looking eastward, showing reredos and throne.—— Part 3rd of the new and rewritten issue of "Ure's Dictionary of Arts, Manufactures, and Mines" (Longman & Co.) has been published for January. It extends from "Boring" to "Calomel," and contains an excellent article on "Brick," illustrated by engravings of brick-making machinery. "Brass" and "Cable" also form articles of some importance.——"Lever's Year-book and Railway and Mining Almanac" (Thomsons, Market-street, Manchester), is a useful compendium, for 1860, of facts relating to railways, mines, metals, minerals, bridges, tunnels, breakwaters, &c. with list of railway officials; literary, scientific, and philosophical institutions, and their officers; returns of imports and exports, &c. It contains two horrible caricatures, however, of Brunel and Stephenson, which it would have been much better without, and which, we dare say, most purchasers of any taste will tear out for themselves.—— Amongst a heap we observe two pamphlets on the "Great Ship" great squabble,—one titled "Two Letters to the Shareholders, from L. S. Magnus;" the other, "Minutes of Proceedings" of the meeting of 13th December, with "A Critical Notice," by H. Guedalla. We have no intention, however, to trouble our readers with these unfortunate misunderstandings, and can only express a hope that, now that the directors have resigned, and a committee been appointed by the shareholders, matters will be placed upon a better footing, and the Great Ship principle obtain a fair trial. Mr. Scott Russell, we observe, is not inclined to be altogether silent under the share of opprobrium he has come in for in the squabble, but has published a kind of report of his own on the state and merits of the big ship, which, he says, it was never intended should be completed till after her trial-trip. —— A reprint of "Experiments on the Comparative Tensile Strength, &c., of Steel and Wrought Iron, by Messrs. Robert Napier & Sons," from the "Transactions of the Institution of Engineers of Scotland, Vol. II." and noticed by us on a previous occasion, has been published by Mackenzie, Howard-street, Glasgow.——"Country Trips," by W. J. Pinks (Pickburn, 35, Rosoman-street, Clerkenwell), is the first volume, just issued, of a little work comprising a series of descriptive visits to places of interest in various parts of England. It contains some pleasant reminiscences connected with various, more or less, well-known localities.

Miscellanea.

ST. DOULOUGH'S CHURCH, CO. DUBLIN.—The preliminary arrangements of the committee for the restoration of this stone-roofed church are stated to be progressing satisfactorily, and the necessary funds will be soon forthcoming. It would seem to be a matter for much congratulation that this ancient relic, perhaps the most perfect in Ireland, should be rescued from ruin; but it would be better it should be left alone than undergo the process prevalent now-a-days. We trust that, if touched at all, it will be confided to an experienced antiquarian architect.

THE QUEEN'S ROOM AT THE PRINCESS'S THEATRE.—Determined at any rate to *deserve* Royal favour, and to show his desire to obtain it, Mr. Harris has fitted up a handsome and spacious retiring-room in close proximity to the Queen's box. It includes what was formerly Mrs. Charles Kean's dressing-room (the partition has been removed), and is furnished with handsome chairs, looking-glasses, console tables, a table of looking-glass in the centre, and chandeliers. The walls are hung with a light paper with gold spots, formed into panels, with a rich, though somewhat heavy, border of flowers. The whole is creditable as well to Messrs. Rogers & Dean, by whom the work has been done, as to the spirit and enterprise of the lessee.

IRON NAILS IN WOODEN SHIPS.—M. Kuhlman asserts that the use of iron nails in building wooden ships is one of the chief causes of their decay. The rotting or decay of wood is a process of slow combustion or oxidation; and M. Kuhlman considers that the iron nails act as carriers for oxygen, and introduce it into the substance of the timber. By contact with water and air the iron is rapidly converted into a sesquioxide. In this state it yields a portion of its oxygen to the wood, and is reduced to the state of protoxide, which further action of air and moisture converts it to the sesquioxide, and so the process goes on, by a sort of catalysis.

LEEDS TOWN-HALL BELL.—The Victoria bell, cast for the Leeds Town-hall by Messrs. Warner and Sons, of Cripplegate, London, has at last been permanently fixed in the tower, and can now be rung, tolled, or chimed, on special and festive occasions, and applied to denote the hour so soon as the clock shall have been fixed by Mr. Dent. The instruction to Messrs. Warner, by the Town-hall Committee, was to provide a bell of 4 tons, and they have produced one of 4 tons 1 cwt. 1lb. The design for the bell was prepared by Mr. Boswell, the foreman of the establishment, under whose superintendence it was cast. Its composition was 3½lbs. of cake copper to 1lb. of tin. The note produced, B natural, is said to be rich, full, and sonorous. The diameter of the bell is 6 feet 2 inches, height 5 feet, thickness of sound-bow 6 inches, and weight of clapper (which is of wrought-iron) 1 cwt. Upon one side of the waist there is a profile of her Majesty, and upon the other the royal coat of arms and Messrs. Warners' patent. The bell, it may be remembered, was brought down to Leeds in the last week of August, and successfully raised, and fixed temporarily for trial, on the 30th of that month. But beyond this and the first trial, little further was done until last week, when the bell was permanently hung upon a wheel, and provided with the apparatus by which it may be rung. The wheel is 10 feet in diameter, or 30 feet in circumference, having two grooves for a couple of ropes, by means of which the bell may be effectually rung, as it has already been. It is believed that the bell will be heard a distance of about six miles when rung; and, when tolled or chimed, three or four miles. It has the advantage, which the more unwieldy bells do not possess, of being perfectly under control. The Great Peter, of York Minster, which, excepting Big Ben of Westminster, is the largest and heaviest in the United Kingdom (weighing 27,000lbs., or nearly three times the Victoria bell, and having a diameter of 7 feet 7 inches), is practically rendered almost valueless, owing to its ponderous weight, and can only be tolled, not rung. Great Tom of Oxford was rehung in 1834, but it was only rung three parts up, when the wheel gave way; and since then the bell has been chained down by order of the church authorities, though occasionally tolled, like the Great Peter, with a hammer. Great Tom of Lincoln, which weighs 12,000lbs., and the great bell of St. Paul's, which weighs 11,500lbs., and has a diameter of 9 feet and a circumference of 28 feet, are in the same undignified condition, and simply strike the hours. The cost of the Leeds bell and fittings we understand will be about 1,000*l*.

SOUTH KENSINGTON MUSEUM.—During the week ending 14th January, the visitors have numbered 12,564.

ST. PHILIP'S, CLERKENWELL. — St. Philip's Church has been closed for some time past for the re-arrangement of the interior. The pews and huge erection in front of the altar, the pulpit, prayer-desk, and clerk's desk, have been removed, and replaced with open benches, pulpit, choir stalls, &c. The architect is Mr. W. Butterfield. Mr. John J. Austin is the churchwarden. The church will be reopened on the 26th instant.

LIVERPOOL ARCHITECTURAL SOCIETY. — The seventh meeting of the session of this society took place on Wednesday night, 28th ult., at the Royal Institution, Colquitt-street, Mr. Barry presiding. After the transaction of some routine business, Mr. J. Audsley read the second part of his paper on "Colour, as applied to Ecclesiastical Decorations; and the History and Practice of that Art." Mr. Audsley, in his paper, considered the art principally in its modern application, and illustrated his subject by several drawings.

INSTITUTION OF NAVAL ARCHITECTS.—A meeting, principally of shipbuilders and the shipbuilding officers of her Majesty's dockyards, has been held at the Society of Arts, for the establishment of an Institution of Naval Architects. Sir John Pakington, the Earls of Ellenborough and Hardwicke, Sir Francis Baring, Sir James Graham, Mr. Sidney Herbert, Lord Clarence Paget, and Mr. H. T. L. Corry have accepted vice-presidentships. With these are also associated, as vice-presidents, several professional and scientific gentlemen; and it has been resolved to offer the presidentship to the Duke of Northumberland. The managing council consists exclusively of professional gentlemen, and includes the master shipwrights of all her Majesty's dockyards and several of their assistants, the principal surveyors of Lloyd's Shipping Register Office, &c. Mr. J. D'Aguilar Samuda, shipbuilder, of Millwall, has been nominated treasurer. With the council are connected Mr. Joseph Maudslay and Mr. J. Macgregor; and to these names have been added those of Sir W. Armstrong, Captain E. P. Halsted, R.N., and Captains Sullivan and Walker, of the Board of Trade, who will be invited to become associates of the council. Mr. E. J. Reed, the naval editor of the *Mechanic's Magazine*, is the secretary.

THE NEW GOVERNMENT BUILDINGS AT PORT ADELAIDE (SOUTH AUSTRALIA).—The foundations of the new custom-house, police-station, and the local court at Port Adelaide being completed, the chief stone has been laid. The building has a frontage to the commercial-road of 135 feet, and to St. Vincent-street of 86 feet 6 inches. The centre portion of the frontage to the Commercial-road is occupied by the court-house. The court-room is 36 feet by 28 feet. The height of this part of the building, from the ground to the ridge of the roof, is 26 feet, above which the cupola is raised 20 feet additional. On either side of the court-house are two-story wing buildings, each 34 feet high. That on the right is to be occupied by the custom-house, having on the ground-floor the Long-room, 44 feet 10 inches by 23 feet 10 inches, and other rooms. The fittings are to be of Sydney cedar. On the left side of the court-house is to be the police-station. The whole of the buildings are to be surrounded by an arcade 5 feet wide in the clear, supported by pillars and arches. The front will be executed in rubble stone, with brick cornices, string courses, and dressings. The contractors for the buildings are Messrs. English & Brown. The clerk of the works is Mr. Abbott, of the colonial architect's office.

THE IRON TRADE.—There are 125 furnaces in blast, in the iron districts of Scotland, which are computed to have produced 950,000 to 960,000 tons of pig-iron over 1859; and the demand has well nigh kept pace with this produce, which exceeds 1858 by 105,000 tons, and 1857 by 72,000 tons. The price in 1857 was 70s., while the ruling rates of last year have ranged from 47s., the lowest point, to 58s. 9d., the price obtained in the closing week of December. The average number of furnaces in blast, in the South Staffordshire district, during the past year, was 135, which produced 786,240 tons of pig-iron: the average number of furnaces in Shropshire in blast was 25, which produced 145,600 tons; in the Forest of Dean, 4 furnaces in blast, which produced 23,296 tons; making a total of 955,136 tons of pig-iron produced during the year in these districts: add to this 960,000 tons, the produce of Scotland, which gives a total of 1,915,136 tons; exclusive of the produce of South Wales, North Wales, Derbyshire, Yorkshire, North Staffordshire, and the Ulverstone and Cleveland districts.

ST. SAVIOUR'S CHURCH, SOUTHWARK. — The east window of this church has been filled with stained glass with three subjects, from the life of our Lord, viz.—the Birth, Ascension, and Crucifixion,—and foliage, with diapered ruby and blue for backgrounds, surrounded by borders. The artist employed was Mr. Charles Gibbs, of 148, Marylebone-road, who was the successful competitor for the same.

THE GLOUCESTER WATER WORKS AT WITCOMBE.—A slip occurred, some time ago, at Witcombe, and another has just occurred. "The whole system of operations," says the *Gloucester Chronicle*, "seem to be a gigantic blunder; and a great deal of public indignation is expressed. The highest engineering skill in the kingdom is to be consulted on the matter. A greater portion of the soil of which the embankment is made should have been burnt before it had been put together, for under present circumstances it does not seem likely that it will ever form a tenacious mass."

THE EFFECT OF THE STRIKE ON THE HEALTH OF WORKMEN'S FAMILIES.—For some time past the Registrar General has noticed in the weekly bill of health of the metropolis the number of deaths which have occurred weekly in the families of bricklayers, carpenters, masons, painters, and plasterers,—trades which have been sensibly affected by the strike. The number of deaths of wives and children of such workmen in the first week of the new year, was sixty-nine. It is useful to direct attention to such statistics, as showing the effect of certain conditions upon health. It would be, therefore, valuable to give, at the same time with those figures, the *average* number of deaths amongst the children and wives of those belonging to the trades.

SOUTH AUSTRALIAN ASSOCIATION OF ARCHITECTS, ENGINEERS, AND SURVEYORS. — At the first monthly meeting of the second year of the above association (the Hon. Major Freeling in the chair), the paper promised by Mr. Goyder for this meeting not having been forwarded by that gentleman, Mr. G. E. Hamilton initiated a discussion respecting the iron ores of the colony, and gave an interesting account of the methods adopted in the preparation of the pig iron of commerce. The drift of his argument was to show that the probability of the iron ores of this colony ever being manufactured was very faint, for reasons that he advanced. He showed that they were of too high a percentage of iron for successful smelting. At the close of his remarks he promised at an early day to introduce the subject in a paper, and to illustrate it by diagrams; also to couple with it his opinions as to the probability of obtaining coal in the colony. It was resolved that the committee consider the proposition of sending to England for books of reference, &c., and to be prepared with a report as to what books they recommend, &c., by the next monthly meeting.

ST. ANDREW'S CHURCH, DUBLIN, DESTROYED BY FIRE.—The church of St. Andrew, commonly called the "Round Church," has been destroyed by fire. Smoke was first observed issuing from the roof. The spread of the fire to the roof of the square wing, at the rear of the round building, was prevented by cutting the roof, and thus breaking off the connection, which was done by the firemen. This wing is separated from the body of the church by a stone wall, and contains the belfry and the vestry rooms. In a short time the ruined roofless walls of the round building, together with the burning *débris*, were all that remained of the church. The entire interior of the church, including pews, galleries, and organ, were reduced to a mass of charred ruins. Providentially, the fire did not break out until after all the congregation who attended the Sunday morning service had dispersed. Had it been otherwise, and an alarm of fire been given while the church was full, fearful consequences might have ensued, as the only means of exit was the one large door in the front. The fire is supposed to have originated from a flue in the roof. The Round Church, which no longer exists, was built in 1793, and opened for public worship in 1807, at an expense of 22,000*l*. The design was an imitation of the Church of St. Mary de Rotundo at Rome, and the architect was Mr. Francis Johnston. The building was capable of accommodating 1,200 persons. It was insured until about two years ago. It is but a few weeks since we expressed our fear of hearing more about the church flues ere the winter was over. The worst of it, too, is the imminent risk of fires breaking out during divine service; for, of course it is while the flues are heated for service that the fires break out.

PHOTOGRAPHIC SOCIETY OF LONDON.—This society has opened its annual exhibition of photographs in the gallery of the old Water-Colour Society, Pall-mall East. It is a very good collection.

GAS.—"The Town Council of this city," says the *Chester Chronicle*, "have decided on adopting the recent Act for the inspection of gas meters. Many complaints are made that gas is reduced in price, yet that the quarterly bills increase in amount. The dry meter is said to be the best and the easiest managed." Various other towns are moving in this matter.——The price of gas at Winchester has been reduced from 6s. 6d. to 6s., and the quality of the gas, it is said, improved, as well as the quantity increased.——The result of the gas agitation at Inverness is now partially realized, the price being reduced to 7s. 6d. per 1,000 feet for the public lights. No reduction, as yet, has been made to the private consumer.

INCREASE OF RAILWAY EMPLOYMENT. — The army of "railway men" which, in 1848, numbered 52,688, increased in ten years to 109,329. The guards and brakesmen increased from 1,496 to 3,747, and the stationmasters from about 1,150 to 2,679. The secretaries and managers increased from 111 to 241. Of engineers the increase was only from 95 to 145. Gatekeepers increased from 401 to 2,084. There was a falling off in the number of watchmen and policemen from 2,475 to 2,214. Switchmen increased from 1,058 to 3,431. The increase in the number of engine-drivers was from 1,752 to 3,508.

CARICATURA.—It is probable that almost all the popular ideas of prime ministers and leading politicians have been moulded and shaped by the caricaturist. Who does not know the pompous yet kindly Peel, the versatile large-hearted and large-brained Henry Brougham, Russell, or Palmerston, better by Leech's pencil than by any other portrait? When we see the great originals, we are disappointed that they do not come up to the woodcuts; that "Pam" is not so jaunty, nor Brougham so eccentric, as he is drawn. We shape the ideal head to the speech, and measure the action by the dress. The caricaturist has been up earlier than the historian, and has stolen a march on him. He influences popular knowledge, though forgotten: the very water in the well of truth is stained by his ink; and, to the end of time, we shall never be quite sure that Palmerston does not carry a perpetual bit of straw in his mouth, or that the nose of Oliver Cromwell was not as red as the lattice of a country roadside inn, so deeply are we tinged with the teachings of the caricaturist.—*The Leader.*

TENDERS

For alterations at No. 37, Frederick-place, Hampstead-road, for Mr. J. Hawes. Mr. J. Tanner, architect. Quantities supplied:—

Turner & Sons	£495 12 0
Batterbury	3[illegible] 12 0
Matthews & Co.	294 12 0
R. Lawrence	291 12 0
Taylor	266 12 0

For alterations and additions at No. 36, Frederick-place, Hampstead-road, for Mr. J. Hawes. Mr. J. Tanner, architect. Quantities supplied:—

Turner & Sons	£197 12 0
Batterbury	145 12 0
Matthews & Co.	141 12 0
R. Lawrence	137 12 0
Taylor	134 4 0

Tenders for Southern Outfall Sewer.—We are asked to add, to the list of contractors who tendered for this work, the name of Mr. W. Webster, 307,700*l*., and that of Mr. W. Lavers, 315,000*l*. Further, that the amount named by Messrs. Helling & Yeoman, was 425,484*l*.

Bowes Manor.—Sir: In justice to the builders whose tenders for works at Alderman Sidney's, Bowes Manor, appeared in your paper of last week, may I beg the insertion of the following remarks:—The lowest tender, which was evidently considerably below the fair value of the works to be done, was not accepted, inasmuch as it was forwarded without the sanction of Mr. Fidler, in whose name it appeared, and the result has been that the next lowest tender, that of Mr. Carter, has been accepted. EDMUND WOODTHORP, Architect.

TO CORRESPONDENTS.

Glass and Stone.—A subscriber asks to be informed what is the *best cement* for stopping glass in stone work? "The glass is in large squares, and is put into rebates (instead of grooves, as in ordinary glazing in lead work): the stone is Painswick freestone, and the situation is one of the most exposed, being on a hill. I have tried Portland cement, but it will not adhere to the stone sufficiently, and plaster of Paris will not stand the effects of wet and frost, especially on the sills of the windows where the wet accumulates."

Anti-Humbug.—J. G.—Oliver Philcox (we have no recollection of the communication referred to).—Z. (it varies: from 1½ to 2 per cent. is not an unusual charge).—T. L.—E. S.—Mr. O.—C. W. C. (it was *Mr.* Brunel who swallowed a half-sovereign).—D. A.—G. P.—J. N.—W. P. W. H. B. A.—P. D.—Inquirer (apply to Secretary at No. 9, Conduit-street).—T. W. C.—J. R. C. (we shall be glad to see the drawings).—G. D. Bt. (we are forced to decline advising in private questions).—Lady L.—W. L.—W. W.—C. B. A.—J. E.—T. G. A.—Practise.—J. E.—J. P.—F. E. H. (thanks. We have already given some account of the southern outlet sewer: but will use a portion).